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MAPPING

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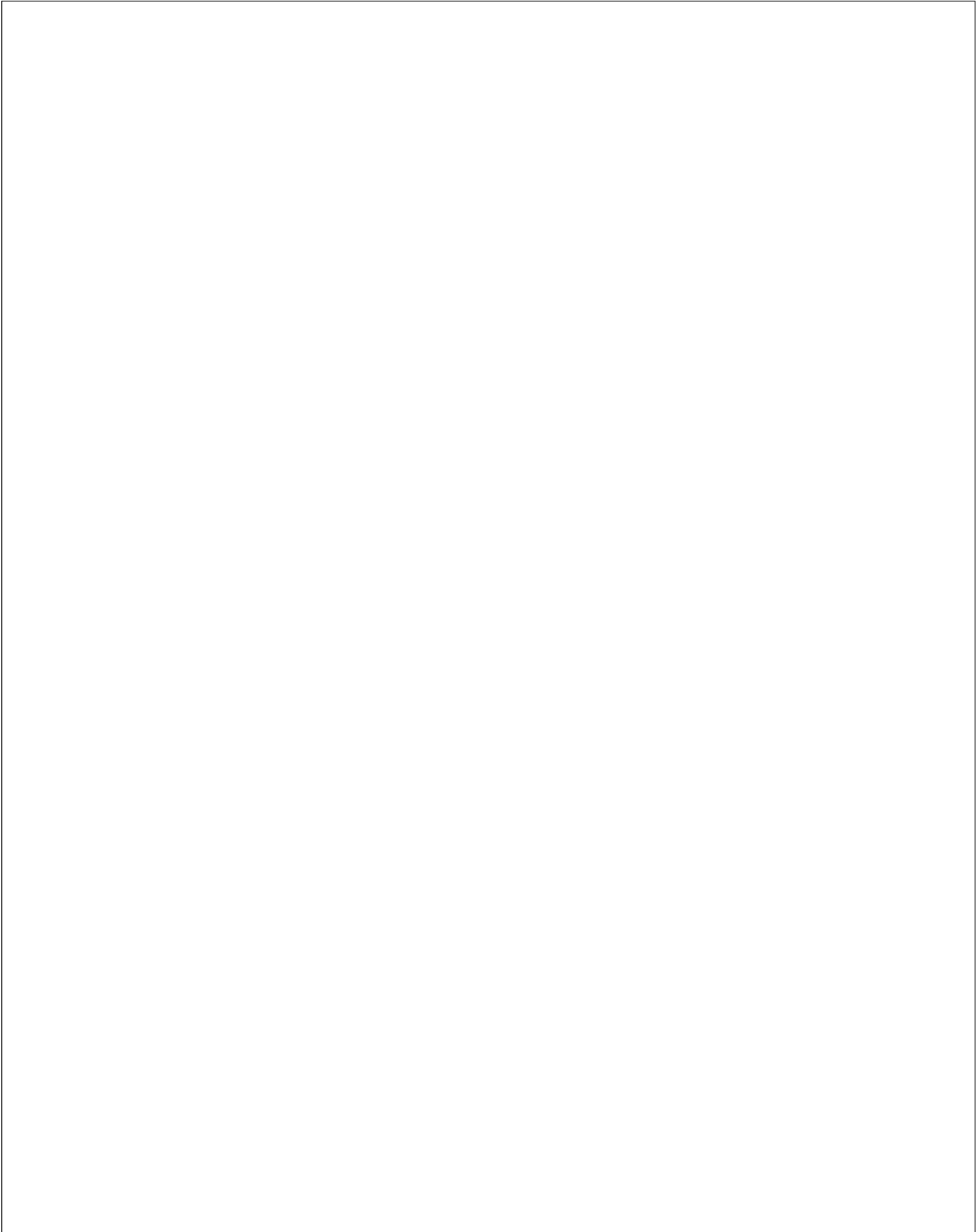


A guide to
understanding and responding to
HIV vulnerability



IOM International Organization for Migration







THE WORLD BANK



United Nations
World Food
Programme



Family Health
International



IOM International Organization for Migration



MAPPING MADE EASY:

A guide to understanding and
responding to HIV vulnerability

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FOREWORD

Roads are linking communities, shipping ports are bustling with business and tourism is reaching remote areas. Goods and people have always been moving, but are now doing so on unprecedented scales. Numerous forms of networks emerge, evolve, connect or merge. These dynamics of population movement have a demonstrated impact on the course of the HIV epidemics.¹

To explore, to understand and to take action on such interrelations and complexities require the capacity to locate objects and events *in* space as well as to capture movement *through* space. Mapping can render invaluable assistance in these efforts. It can be cheap, useful and fun! Mapping is a ‘Do it yourself’ art, which can be useful in different shapes and forms and is within the means of most organizations and individuals. Besides the technologically advanced field of Geographic Information Systems (GIS), there is plenty of space to produce maps, using less complex methods, to meet our needs of the moment. This ranges from maps drawn ephemerally in the sand to tailoring existing sophisticated and commercially available maps. Once we understand that mapping can be easily accessible and feasible, even with limited resources, it can then become a powerful tool to assist in achieving our objectives.

UNDP South East Asia HIV and Development Programme (UNDP-SEAHIV), with its focus on the interrelationships between development and HIV/AIDS, has been promoting mapping for research, policy and programmes since the beginning of its activities. Its experience may be of interest to others. In teaming up with seven other organizations UNDP-SEAHIV has been able to produce a far more enriched and diversified Guide than it could have done on its own.² Our partners have been crucial at all stages of the process of developing this Guide: from contributing their experiences to testing the Guide within their own organizations.



Lee-Nah Hsu

Manager





Building Regional HIV Resilience

UNDP South East Asia HIV and Development Programme

¹ Mapping HIV Vulnerability along Kampong Thom, Siem Reap, Odor Meanchey and Preah Vihear, Cambodia (UNDP South East Asia HIV and Development Programme, March 2004), <http://www.hiv-development.org/publications/cambodia_prip.htm>.

² The team was composed of United Nations Development Programme South East Asia HIV and Development Programme (UNDP-SEAHIV); United Nations Educational, Scientific and Cultural Organization (UNESCO); the World Bank Group (WB); United Nations World Food Programme (WFP); Family Health International (FHI); the United States Agency for International Development (USAID); International Organization for Migration (IOM); and World Vision International (WVI).

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I. THE ‘WHAT’, ‘WHO’ AND ‘WHY’ OF THIS GUIDE

1. What is this guide about?

Mapping Made Easy: A guide to understanding and responding to HIV vulnerability is a step-by-step Guide to understanding and identifying *spatial* links related to HIV vulnerability. The Guide provides examples of how to use information to make maps and how maps are used to explain concepts in a visual way that most people can easily understand.

Maps are useful in our everyday lives. We can use maps to plan trips and to see where things are located. Not only do maps help us in making decisions, but they are also useful tools for showing relationships between objects and complex issues.

This Guide can be a tool to build local and national capacity to map vulnerability and to respond to HIV. In addition, by integrating mapping into an Early Warning Rapid Response System (EWRRS), it can be used as a tool of good governance and can increase governments’ and communities’ abilities to identify potential *stressors* that may increase HIV vulnerability and to respond by taking actions to pre-empt potential epidemics.³ A realistic understanding of HIV vulnerabilities in communities is the prerequisite to effective multisectoral responses engaging the health sector and other development sectors, such as agriculture, education, poverty reduction, rural development and transportation.

This Guide has drawn from field experiences in Asia and Africa and includes maps and graphics from these experiences.⁴

2. Who is this guide for?

This Guide is useful for community members, professionals, and leaders working in HIV prevention and AIDS care and mitigation. It is both for those who make HIV vulnerability maps and for those who use maps to assist in doing their work.

In addition to the health sector, this Guide can be useful for various development sectors. Some of these sectors are listed below:

- Agriculture
- Construction

³ For more information on Early Warning Rapid Response Systems, please refer to: Early Warning Rapid Response Systems for HIV/AIDS: A Manual for Early Warning Rapid Response Systems for HIV/AIDS. (UNDP South East Asia HIV and Development Programme, November 2004), <http://www.hiv-development.org/publications/ewrrs_manual.htm>; From Early Warning to Development Sector Responses against HIV/AIDS Epidemics (UNDP South East Asia HIV and Development Programme, May 2003), <<http://www.hiv-development.org/publications/EWDSR.htm>>; and Early Warning Rapid Response Systems: HIV vulnerability caused by mobility related to development (UNDP South East Asia HIV and Development Programme, July 2000), <<http://www.hiv-development.org/publications/ewrrs.htm>>.

⁴ Detailed references for the figures in this guide can be found in Annex III.

- Education
- Maritime industry
- Poverty reduction
- Transportation

In short, anyone who implements HIV prevention and AIDS care programmes can use this Guide. This Guide can also be useful for people who would like to do non-HIV/AIDS related mapping. This Guide will provide examples of how to use data to make maps and how to explain findings in a way that can be easily understood.

The joint efforts of the following organizations made this Guide possible:⁵

- Family Health International;
- International Organization for Migration;
- United Nations Development Programme South East Asia HIV and Development Programme;
- United Nations Educational, Scientific and Cultural Organization;
- United Nations World Food Programme;
- The United States Agency for International Development;
- The World Bank Group; and
- World Vision International.

These organizations hope that the Guide can be used by:

- Community-based organizations;
- Donors;
- Intergovernmental organizations (IGOs);
- Local, provincial and national governments;
- Non-governmental organizations (NGOs);
- Political parties;
- Programme planners and implementers; and
- Universities and other academic institutions.

3. What is vulnerability?

Rather than searching for a concrete definition of *vulnerability*, there is a need to maintain some flexibility and possibility in order to allow for adapting to circumstances. What we need to understand is the underlying meaning. The basis of the term vulnerability comes from the Latin word *vulnus*, which means *wound*.⁶ Therefore, vulnerability is the potential of being wounded. It is important to note the *potential* aspect, because this is what enables interventions to prevent the situation from occurring.

⁵ Please see Annex IV for the list of contributors to the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability, held from 15–17 June 2004 in Bangkok, Thailand.

⁶ The Concise Oxford Dictionary, Ninth Edition (1995).

4. What is HIV vulnerability?

In the context of HIV/AIDS, *vulnerability* results from personal, programmatic and societal factors that affect one's ability to exert control over one's health or well-being (refer to box 1).⁷ This includes factors – such as floods, droughts and poverty – which can influence a person's decision and choice on their own livelihoods.

Both risky behaviour and environment are what translate HIV vulnerability into actual risk of infection. An HIV-vulnerable person may or may not become infected with HIV. Infection depends on his/her behaviour, such as the use of condoms when having sex or also the use of clean needles and syringes for injecting drugs. Therefore, biological markers such as HIV infection or sexually transmitted infections are used to verify the consequences of the behaviours adopted by vulnerable people. In addition, risky environments can adversely affect an enabling environment. For example, risky environments can include environments where condoms and other HIV prevention programmes and services are unavailable or where a sex worker is coerced into sex without a condom for more money and because she needs the money.

If given the choices and tools to prevent risky behaviour, most people could avert actual HIV infection. This is the objective of mapping HIV vulnerability – so one can take appropriate steps to assist populations in reducing their vulnerability, thus averting their risk of HIV infection.

5. Why is HIV vulnerability important?

The concept of HIV vulnerability is important because it allows us to look beyond responding to high risk behaviours. It allows us to address broader issues of response, such

Box 1: Three interdependent levels of HIV vulnerability

- **Personal vulnerability** to HIV/AIDS focuses on the various factors in an individual's development or environment that render him/her more or less vulnerable, such as physical and mental development, knowledge and awareness, behavioural characteristics, life skills and social relations.
- **Programmatic vulnerability** focuses on the contributions of HIV/AIDS programmes toward reducing or increasing personal vulnerability. This includes information and education, health and social services and human rights programmes.
- **Societal vulnerability** focuses directly on the contextual factors that define and constrain personal and programmatic vulnerability. This includes issues such as political structures, gender relationships, attitudes towards sexuality, religious beliefs, violence and poverty.

⁷ J. Mann, D. Tarantola, eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses*. New York: Oxford University Press, 1996, 441- 462.
<<http://www.aidslaw.ca/Maincontent/issues/discrimination/discussionpapers/DISCdiv.html#DISCdiv%20Vulnerability>>

as mobility and development. It also enables us to design programmes to mitigate the impact of AIDS on families, communities and mobile populations.

As countries and regions strive to develop, inevitable ‘push-pull’ factors trigger the movement of people. This can be the result of land reform, the search for economic well-being, or the increased accessibility to transportation infrastructure. Although mobility stems from a variety of factors, it is not always a matter of choice, particularly for those from underdeveloped communities. Mobility in search of employment and to increase one’s quality of life is a typical reaction to developmental activities. Increased choices and opportunities through developmental activities encourage the influx of people from neighbouring areas searching for opportunity and striving to raise their quality of life. In addition to generating employment opportunities, development also stimulates the construction of transportation infrastructure (i.e. roads), whereby people can access these opportunities.

One must also acknowledge the importance of culture and ethnicity. Culture determines how we interpret and respond to the world around us. Beliefs may affect whether an intervention will be accepted or not. Different ethnic groups have diverse practices. These practices may not only expose people to risk, but also create various means for building resilience.

Despite providing opportunity and choice for diverse peoples, one must consider the effect of development in terms of HIV/AIDS. Mobility and some culturally-related practices may increase the vulnerability of individuals and communities to HIV infection. Sex workers, migrant workers and tourists, among others, all interact with one another. Through mobility, they interact with people in the source, transit and host communities. Social, economic and environmental factors associated with mobility increase HIV vulnerability for all. These factors include separation from loved ones and cultural norms, access to alcohol and drugs, lack of non-high risk entertainment, gaps between the rich and the poor, more free-time, availability of sex workers and so on.

6. Examples of HIV vulnerability

The following examples demonstrate that HIV vulnerability can take many forms.

EXAMPLE A

Fishermen and commercial sex workers (CSWs) in Ranong, Thailand (figure 1) were found to have high HIV vulnerability.⁸

- In Thailand, HIV seroprevalence among fishermen from Myanmar was 10 per cent. Factors that increase vulnerability for the fisherman include:
 - Long periods away from home;

⁸ Provincial Chief Medical Officer, Ranong Health Office, Ministry of Public Health (2002).

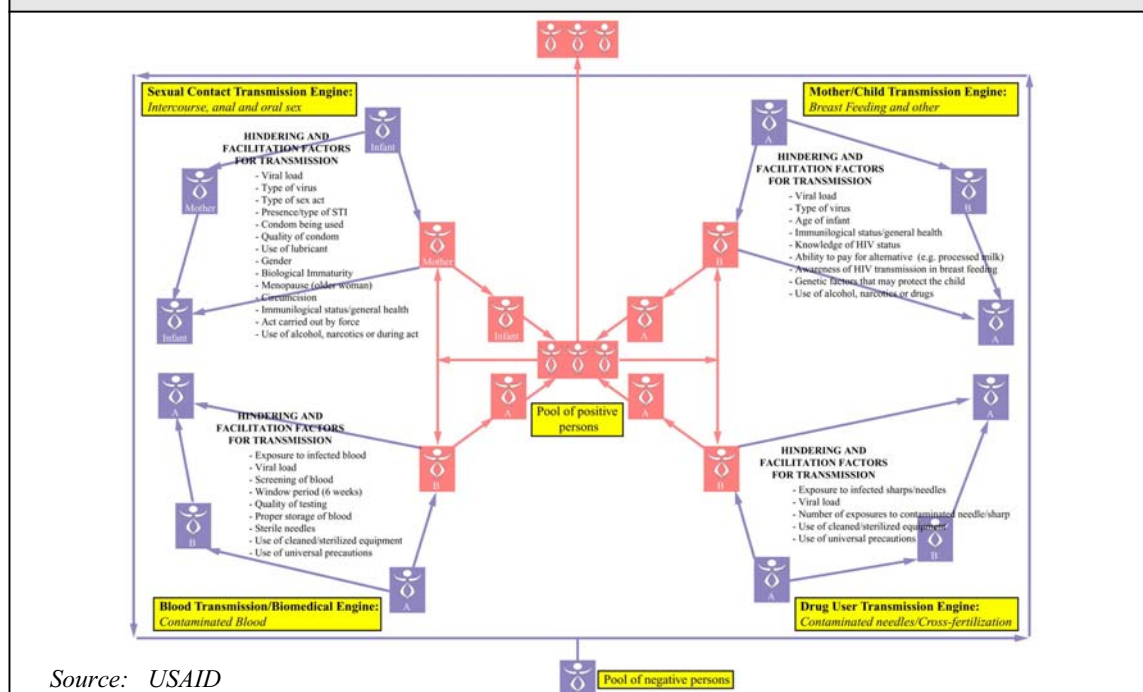
- Relatively large and infrequent salary payments;
 - Cheap commercial sex available at ports;
 - An occupation that is inherently risky and may favour risk-taking behaviour (figure 2); and
 - Lack of condoms when needed.
- Over a third of Myanmar CSWs in Ranong has HIV. Factors that increase vulnerability for CSWs include:
 - Lack of power and control over one's own life;
 - Lack of knowledge and/or access to testing for sexually transmitted infections (STIs);
 - Spouses away for long periods of time without sending money;
 - Prevalence of customers willing to pay for sex without condoms; and
 - Sex establishments that do not provide CSWs with the power to negotiate condom use.

Figure 1. Location of Ranong, Thailand



Source: United Nations Department of Public Information, Cartographic Section

Figure 2. HIV/AIDS transmission diagram (high risk activities vs. exposure)

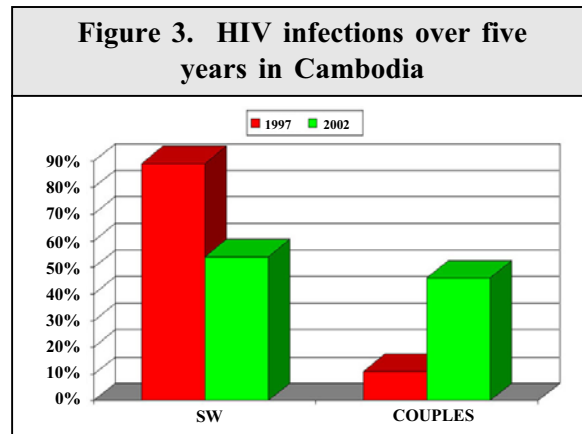


Source: USAID

EXAMPLE B

It has been found in Cambodia that married women are increasingly vulnerable to HIV infection while commercial sex workers (CSWs) are becoming less so. Cambodia has recently implemented a condom promotion programme that has proven effective with sex workers but not for spouses of unfaithful husbands.

- Figure 3 shows the changes in sources of new HIV infections in Cambodia, from a reduction of infections among sex workers to an increase in HIV for wives.
- Vulnerability for these women is partly due to the fact that they are unable to demand condom use from their partners.



Source: UNICEF, New York

EXAMPLE C

Research by UNESCO has shown that lack of citizenship is the single greatest vulnerability factor for hill tribe girls and women in northern Thailand.

- Without citizenship they are likely to be trafficked or otherwise exploited through work in the lowest levels of the sex industry or from coerced sex.
- Lack of citizenship or birth certificates also cuts them off from education.
 - This makes them more vulnerable to contracting HIV through ignorance of safe sex practices (i.e. powerless to negotiate condom use).
 - They are also subject to work in environments in which protective measures may not be accessible.

7. Why map HIV vulnerability?

Mapping the situation 'on the ground' shows us the spatial distribution of vulnerability and can assist in providing an 'early warning' for decision makers since potential stressors (sources) of HIV vulnerability may be identified. Maps are tools that can show HIV programme activities and can also assist in our decision-making about future activities (e.g. the best location for interventions). By analyzing the spatial relationships shown on a map, decision makers can respond rapidly to fill existing gaps by taking action to implement intervention programmes.

For mapping HIV vulnerability, it is useful to hand draw simple community maps on a piece of paper (figure 4). Small and simple local area maps can show local HIV vulnerable spots while large national maps can show an overall country-level situation (figure 5).

Maps can:

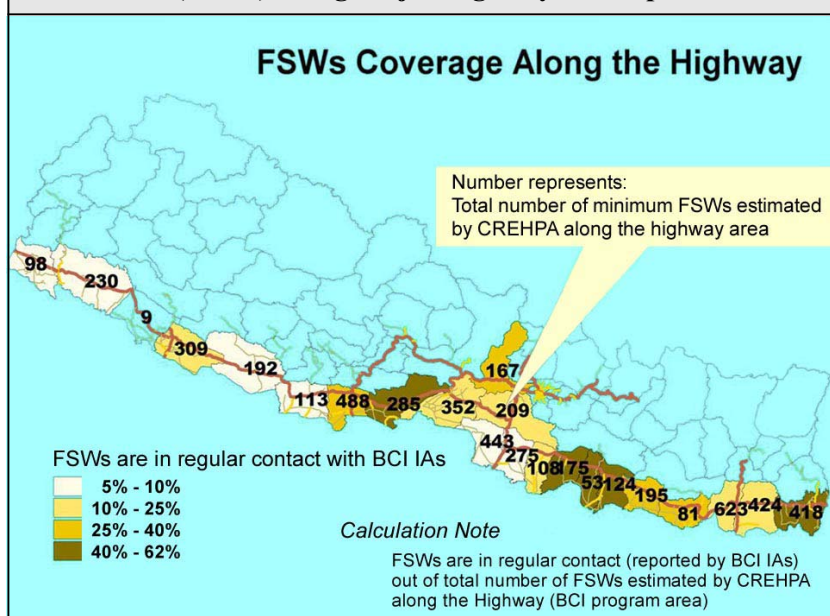
- Help a person to quickly visualize the interrelated elements of a problem
- Allow one to see patterns and gaps clearly
- Allow abstract information to be easily comprehended (unlike lists)

Figure 4. A vulnerability map of Matero, Zambia*



**It was made rapidly to assist in programme design.
Source: Wilson, 2001*

Figure 5. Programme coverage for female sex workers (FSWs) along major highways in Nepal

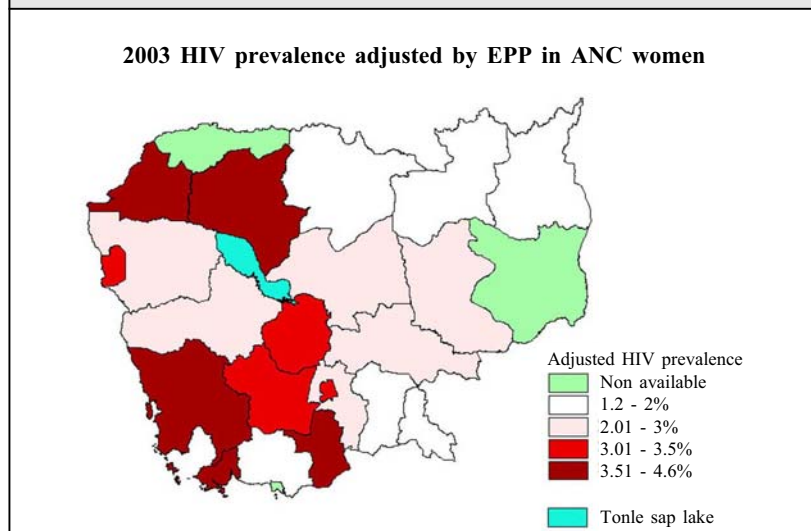


Source: FHI

Serosurveillance maps are often national level maps showing HIV prevalence in different administrative areas (figure 6).

Once mapping of a site has been completed, inventories should be produced followed by rapid ethnographies to get an idea of vulnerability in the study area. The finished product will then become part of a report that provides a picture or 'map' of vulnerability.

Figure 6. 2003 seroprevalence among antenatal clinic women in Cambodia



Source: FHI

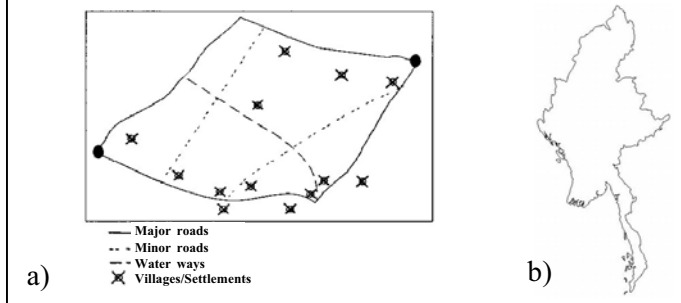
II. MAPPING AS A TOOL

1. What is a map?

Maps are all around us. They can be drawn on paper, carved in stone or even constructed with objects. It is a form of communication which informs us of such things as:

- Location of places and people (figure 7);
- Patterns of distribution; and
- Relationships between various concepts or issues.

Figure 7. a) Outline of a village and b) the Union of Myanmar



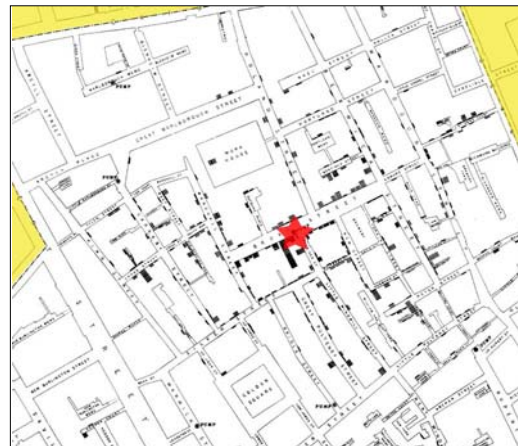
Source: Uhrig

Box 2: Cholera and mapping by John Snow

John Snow's historic work in identifying the cause of a cholera outbreak and taking action to reduce the vulnerability of the local population is an example of how one can use mapping as a tool to educate a community and prevent further spread of infectious diseases.

Mobility and Cholera⁹

John Snow, a London doctor, examined and investigated a cholera outbreak in the Soho district of London during the mid 1800's. The unusually high number of deaths in the district led him to the Broad Street pump. He theorized that the pump acted as a cholera hotspot, due to its contamination. His theory was proven through tracking population mobility to the next community five miles away where there was no outbreak. In this adjacent community he discovered that two women had requested the water from the Broad Street pump and they subsequently were struck with cholera. Mapping supported and solidified his theory that the cholera deaths were due to the contaminated water from the Broad Street pump.



Each black dashed line represents the total occurrence of a cholera infection. The red star indicates the location of the Broad Street pump.¹⁰

⁹ John Snow (1813 – 1854) (BBC online, January 2004). <http://www.bbc.co.uk/history/historic_figures/snow_john.shtml>

¹⁰ The source of this map is <http://www.ph.ucla.edu/epi/snow/snowmap1_1854_lge.htm> and is cited as Map 1.

The key concept of a map is its visual representation of the space around us and the interrelationships between the space and the people, places and things that occupy it.

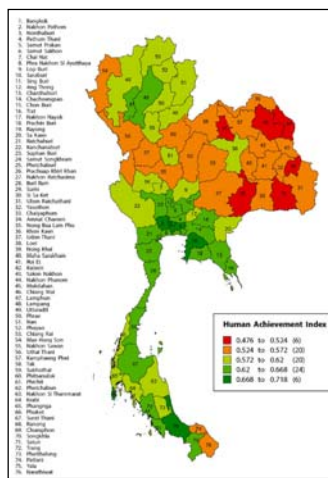
A map is a visual tool that demonstrates and lets us learn about spatial relationships. Maps are flexible – it is up to map-makers to decide what *layers* of information and what data they put on maps. Most maps can be carried around from place to place and can be understood by people of different languages. One can read most maps without words to understand them. Maps can help facilitate discussions to understand a local situation and stimulate possible actions and responses.

Maps have evolved with technology and continue to be a means to communicate a message. These include tourist maps, city/road maps, topographic maps, weather maps and maps based on themes. A few examples are shown in Figure 8.

Figure 8. A few examples of maps

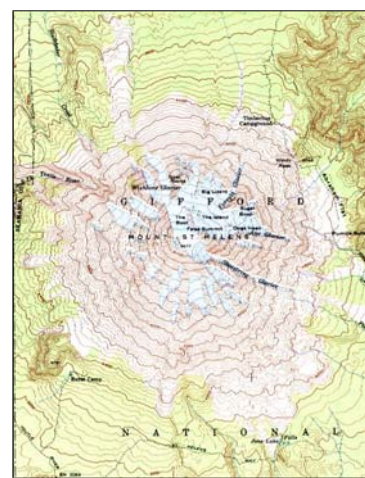


a) Locations of countries in Asia
Source: University of Texas at Austin



b) Choropleth map of the Human Achievement Index of Thailand

Source: UNDP, 2003



c) Topographic map of Mt. St. Helens, USA, before eruption

Source: California State University Sacramento

2. What is mapping?

Mapping can be sophisticated and complicated with technology, such as Geographic Information Systems (GIS) (refer to box 3), or simple and basic, such as drawing a map on a piece of paper with a pencil. A villager using a wooden stick to draw a map of her village in the sand is mapping. Female sex workers drawing a layout of their brothel workplace are making a map. Injecting drug users drawing on a cigarette package to show the sites where drugs are sold are making a map. A cartographer from a research institute using sophisticated electronic equipment to create a series of forest coverage is also mapping.

Box 3: Geographic Information Systems (GIS) An overview¹¹

Geographic Information Systems combines layers of information about a place to give a better understanding of that place. The types of information you include in a GIS depends on your purpose. It is a system of computer hardware, software, data and trained people used to help collect, manage, manipulate and analyze information that has a spatial component. The basic process of a GIS is to link database(s) of information (i.e. numbers, text, satellite imagery) with the map. By doing so, various types of information can be presented visually for analysis, forecasting and decision-making.

GIS is *not*:

- A Global Positioning System (GPS)
- A static map (paper or digital): maps are usually a product or output of GIS
- A software package

Mapping is a useful tool to understand, learn and present information about a situation. It helps us convey a message through the laying out and *layering* of information, which we can then interpret and analyze.

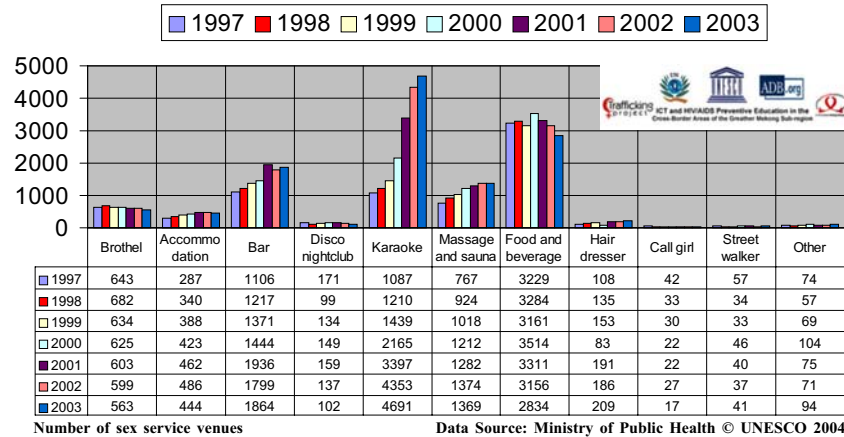
Although a single map is limited in representing changes over time (refer to box 4), it is still possible to show this change. One way to show changes over time is to present a series of maps. Figure 9, provided by UNESCO Bangkok's Culture GIS Unit, shows the evolution of the epidemic in Thailand beginning among men who bought sex in the North of the country.

¹¹ Source: <<http://www.gis.com/whatisgis/index.html>>.

Box 4: Graphs vs. Maps¹²

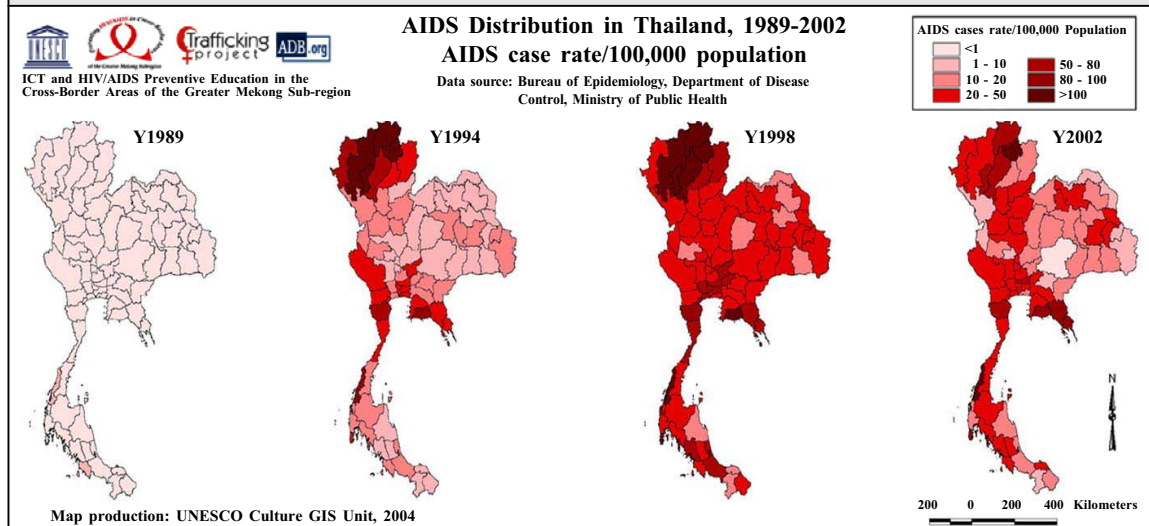
A well-designed graph is sometimes better at showing changes over time than a single map. In the example below, there is a decrease in the number of brothels but an increase in karaoke venues (Note: Reflects the changing hospitality industry in Thailand).

Distribution of sex service venues in 1997-2003



Source: UNESCO, 2004

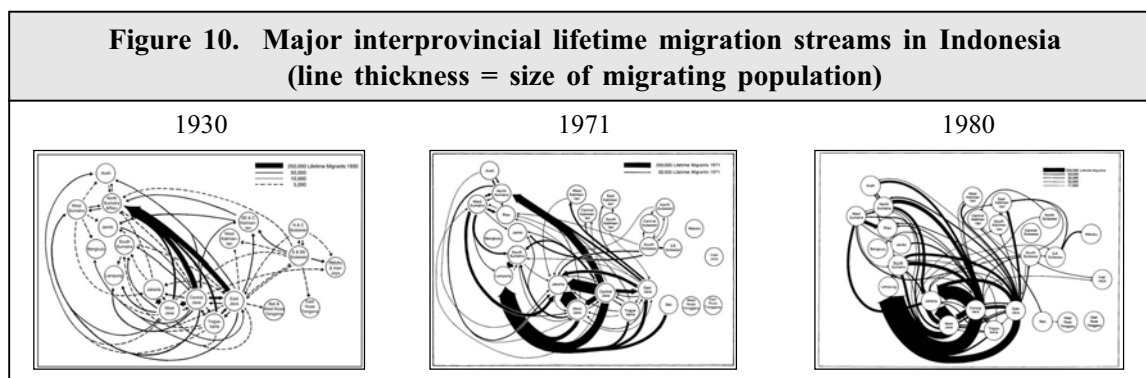
Figure 9. Thailand's HIV prevalence over time



Source: UNESCO, 2004

¹² Graph provided by Wisa Wisessjindawat (UNESCO) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, <<http://www.unescobkk.org/culture/trafficking>>.

Figure 10 is another example of how a series of maps can be used to show the importance of time and mobility and, in this case, the migration streams in Indonesia.



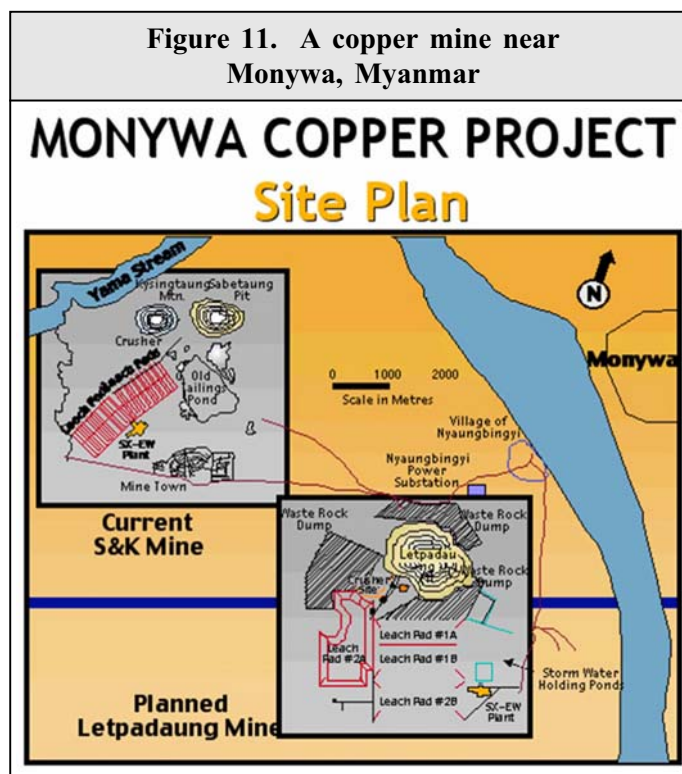
Source: UNDP-SEAHIV, 2001

3. Where can we get maps?

You can make a map yourself or you can use maps made by others.

We usually rely upon others for maps that have already been created showing large geographic areas. It is not necessary to ‘reinvent the wheel’ if maps of the areas of interest are already available. Most government offices in South East Asia have maps, in addition to private companies (figure 11). A large map conveys a lot of useful information. One can use coloured headpins to add information useful for one’s own purpose to these large area maps.

A useful map is often one where information is added to a pre-existing map. For more detailed information for a community, one may need to produce sketch maps locally.



Source: Ivanhoe Mines

Please refer to Chapter V RESOURCES section for a list of examples of where maps are available.

4. What do we map?

What is put on the base map depends on what you want a map to do for you or what you want to show. Overly complex maps with too much information are not helpful. If it takes you too long to explain your maps then people will not bother to look at them. When in doubt, keep the map simple.

A map with layers of information can help us in identifying relationships or links, such as between roads and health clinics. It is important to keep in mind that a map should contain sufficient information without being too complex to read – your audience should be able to easily understand the information on the map. In general, most maps contain the following information:

- Legend
- Distance (i.e. scale/bar)
- Direction (i.e. north arrow)

For ease of communication, advocacy and/or training, maps can help identify issues through graphical representation of the issue(s).

Determining what to put on the map should be a primary concern. For example, if we look at an area where land transport is the dominant means of transportation, it may be relevant to map HIV/AIDS infections to locations of truck stops to show relationships and links. However, if this method were to be applied to an area where water transport (e.g. river boats) is more prevalent, mapping of truck stops would not be as relevant; in this case, identifying the link between ports/piers or an intersection between modes of transportation (i.e. river crossings and roads) and HIV/AIDS would be more applicable.

Mapping HIV vulnerability to aid in programme design (figure 12) may have some of the following features or information types:



*This map also shows us administrative divisions, border areas, cities/towns and rivers.

Source: PSI, Myanmar

- **Physical objects**
 - Hospitals and clinics
 - Location of festivals and local markets
 - Key locations such as sex work venues, entertainment areas, karaoke bars, barber shops, truck stops, injecting drugs shooting galleries, military bases, schools, clinics, pharmacies and guesthouses
 - Prisons and detention centres
 - Political or administrative boundaries/zones
 - Ship harbours and fishing boat docking areas
 - Size and boundaries of an area
 - Sub-divisions of an area
- **People**
 - Distribution of population
 - Ethnic groups
 - Percentage of migrants in a population
- **Others**
 - Approximate resources required for interventions
 - Health, education, social and nongovernmental organization services in an area
 - HIV prevalence
 - Location and coverage of HIV preventive intervention programmes
 - Which organizations are doing what kind of activities (prevention, care, treatment, etc.)

Box 5: A brief summary of maps and mapping

- Maps are:
 - Tools for advocacy: to explain issues to leaders and to reflect situations in a community
 - Visual: used for discussing issues and identifying gaps
 - Mobile: can be transported to different places
- Maps can facilitate discussion between sectors, assist in decision-making and show changes over time
- Mapping is the process of making a map
 - Information can be layered to see interactions
- Mapping can be both sophisticated and simple

III. HIV VULNERABILITY MAPPING

The following section will provide a step-by-step explanation of how to make and use an HIV vulnerability map. The list of steps is not exhaustive but is meant as a guide. The purpose is to introduce and explain fundamental methods of mapping rather than to explain the complex procedure of computer-aided mapping. The focus will thus be on a more ‘hands-on’ approach.

The basic methodology and concept behind mapping is the same whether for hand-drawn sketches or for more sophisticated computer-aided designs. For a comparison of the mapping process for both approaches, please see Annex I.

What one must always keep in focus throughout the mapping process is the purpose of the map – is it for advocacy, programme development, education or service delivery? Once a purpose has been clearly defined, the process of making a map becomes less complicated.

The mapping process can be summarized in the following steps:

A. Identify mapping region/area

- Determine the scale of the map
 - The boundaries of the mapping area can encompass a small (community) or large area (countries)
 - Work within the limits of the map

B. Base map

- Obtain or draw a map of the region
 - Include and label physical information that will help others to understand the layout (i.e. mountains, rivers, landmarks)

C. Collect and organize thematic data

- Collect information relevant to the purpose of the map
 - Commercial sex establishments, roads, truck stops, etc.
- Organize the information so it is easy to read, use and map
 - Keep a copy for future reference so that it can be updated easily

D. Design

- Add thematic data to base map and, most importantly, a legend

E. Presentation

- Prepare and present the map to an audience
 - Local groups, organizations, politicians, etc.

F. Review and update

- Update thematic data
- Identify change over time
 - Was the mapping effective?
 - Can other hotspots or stressors be identified?

Remember to KEEP IT SIMPLE: A simple map can be an effective tool

1. Mapping from a ‘hands-on’ approach

Resources:

- People:
 - Civil society
 - Local groups/clubs
 - NGOs
 - Vulnerable populations
- Materials:
 - Pen/pencil/marker
 - Paper
 - Any other material or medium which can be used to visually display the map (rocks, sticks, string, etc.)

A. Identify mapping region/area

Identify area for mapping on the relevance, concerns or responses from locals and/or participants. In general, the larger the area to be mapped, the more resources are required. Regions/areas can include:

- Community
- Municipality
- Province
- Country/intercountry
- Region specific: transcending administrative/political boundaries (along a road, street, etc.)

B. Base map

Depending on the nature of the area being mapped, a base map can be simple or complex.

- Pre-existing base maps can be found at:
 - Census bureaus
 - Development agencies
 - Geological survey offices (government and private)
 - Government departments (local, provincial, national)
 - Land surveyors offices

- Maps drawn locally
- Private corporations
- Universities and academic institutions
- The following is a sample of steps that can be taken if a pre-existing base map does not exist for a small area:
 - Walk slowly throughout the study area, familiarizing yourself with the site and noting major features. During this trip, map-makers can develop a plan to draw a detailed map of the site by sub-dividing it into smaller, more manageable units and identifying key points for further mapping.
 - Take a draft base map when you walk through a study site. During the walk mark down on the map any major points or features that will help users identify (rivers, roads, mountains, etc.) with the mapping area. Note the distance between each item or feature.
 - Once base map sketches have been made, make a refined version of this information so that it can be used as a 'formal' base map.

A copy should be made of the base map so that future mappings can be performed on the same map, thus retaining the base map information and scale of the map.

C. Collect and organize thematic data

The next step is to add thematic information onto the base maps. Maps are only as useful as their data and this is where one must have a clear goal or purpose for their map and what they are mapping. It is important to include the most relevant information and this will depend on NGOs, target groups and, more importantly, the participation and input of local people as they are the ones who know the 'real' situation within their own community.

- Consult with people who are familiar with the area, asking them to provide further detail on the issue. Mapping special groups requires rapport and trust building. Police and relevant officials should be informed, as they often have relevant information that may be useful. However, one needs to safeguard potential data and maps. The safety and confidentiality of informants should be a key priority, if map-makers are led by the authorities to programme intervention sites and target groups. Also, make sure law enforcement authorities do not use the surveyor to capture/arrest informants – this would violate the ethics of protecting the confidentiality of informants.
- Through participatory approaches, such as facilitating surveys and questionnaires, organizing working groups, or conducting personal interviews with participants, data can be gathered from the public about their concerns regarding HIV/AIDS and their own vulnerability.

- To supplement ‘real’ information gathered from the local people, more ‘official’ information can be obtained from government agencies as these entities may have a broader knowledge base regarding certain types of thematic data.
- An initial exercise can involve mapping the following information:
 - Sex establishments – names and locations of sites and number of sex workers
 - Injecting drug use areas – names and locations of sites and estimated number of injectors
 - Truck companies – names, locations and number of truckers, parking areas, facilities and services surrounding parking areas
 - Enterprises associated with vulnerability (docks, mines, plantations, factories, entertainment venues, bars, etc.) – locations, number and types of employees
- Other information that may be relevant for programme considerations may include:
 - Size of the study area
 - Most recent population estimate for the study area
 - Proportion of the study area consisting of informal settlements and their locations
 - Locations of infrastructure, health and educational facilities and services
 - Hours of operation (e.g. sex establishments) for targeting service delivery
 - Location of public transport services, both during the day and at night
 - Public safety of the study area and its sub-areas (if crimes are common at night, this will reduce night intervention activities, while if it is also unsafe during daytime, this will affect intervention design and delivery)

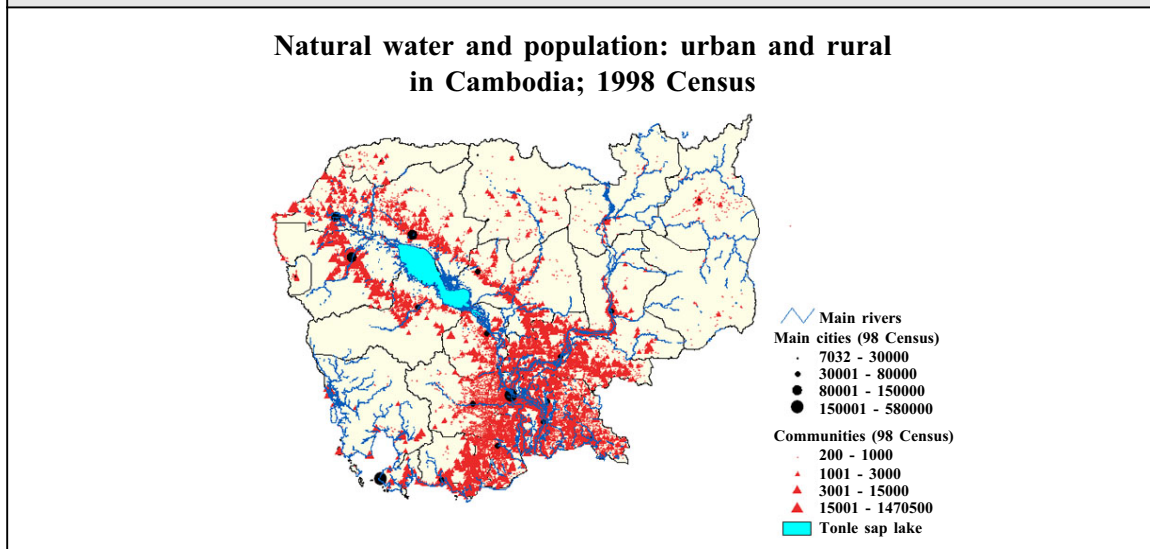
**WARNING: MAPS AND DATA CAN PLACE
CERTAIN POPULATIONS AT EXTREME RISK**

Maps are powerful tools and while they can show interrelationships and situations on the ground, authorities and other individuals can misuse the map and mapping data to harm marginalized people. Be sure to safeguard the people your map is intended to help.

D. Design

Designing a map requires patience and creativity. Mapping elements such as colours, symbols, text, charts and pictures can be applied to the map in any shape or form to present the map’s message or to add to this message. A simple map can be made more effective with a little creativity; the message can be presented in a way which captures the attention of the audience, thus educating or informing the audience of its message (figure 13). **The message and information on the map should not be lost in the design.**

Figure 13. Distribution of population and main waterways in Cambodia*

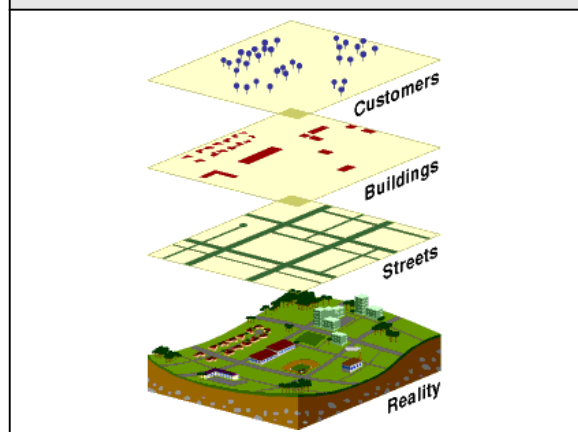


**It is interesting to note the similarities between the shape of population distribution and the natural flow of water in the country.*

Source: FHI

- A unique property of mapping is that it involves 'layering' (figure 14). By layering various types of information about an area, one can begin to identify spatial relationships or links.
- Thematic data can be represented on the map in various ways, including:
 - Symbols
 - Colours
 - Charts
 - Text
 - Sketches
 - Photographs or pictures
 - Physical objects (i.e. rocks, sticks, pins, stickers) *Note: In cases*

Figure 14. The layering effect of mapping



Source: Williams

- where rocks or other physical objects are used to indicate the location of a thematic item, this object either needs to be attached to the map or be drawn on the map.*
- One key element that should always be included in a map is the legend.

- It is important to include a legend so the audience can understand the map design and its message. It is also essential for the legend to be understandable and easily interpreted by future users of the map.

E. Presentation

By presenting the map to local groups, communities, organizations or government offices, discussions will hopefully encourage the development of local strategies, as well as initiating further discussion and thought into building HIV-resilient communities and reducing HIV vulnerabilities. As the saying goes, “A picture is worth a thousand words.”

- One of the more important aspects of mapping and maps is that it can become a tool for change through education. The following is a sample of places where one can present and speak about maps regarding HIV vulnerabilities in an area.
 - Informally:
 - Community meetings
 - Schools
 - Formally:
 - Government meetings
 - Conferences
 - Workshops

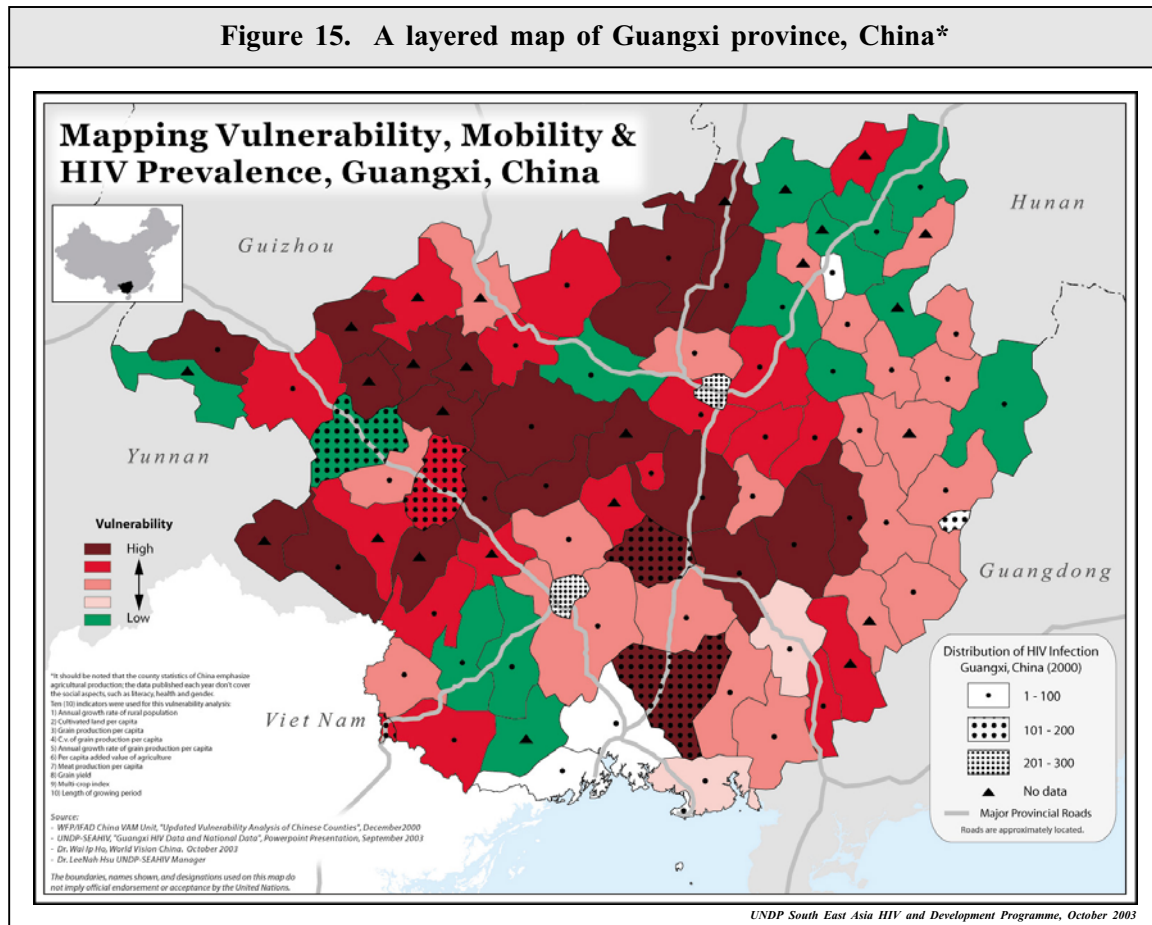
There are several ways to present a map for ease of understanding. A map on a piece of paper can be used to present to a small group. When there is a large audience one can use an overhead projector or computers/digital projector to make the presentation. Layering of maps using transparencies or computer software (e.g. PowerPoint) can be very effective (figure 15).

Maps can be used to explain situations to journalists and to present images that are readily understood for print media or mass media, such as through television or the internet.

Maps can show the current status of hotspots of HIV vulnerability (from sequentially updated maps) as well as shifts, trends or patterns of information such as sex work or drug trade routes. This visual representation can show not only spatial mobility, but also can demonstrate the ‘balloon effect’ of suppression: for example, when authorities ‘squeeze’ or ‘crack down’ on a hotspot, another hotspot develops outside of this original area, and so on, expanding the geographic area of HIV prevalence.

With increasingly mobile populations, as a result of development activities, the ‘not in my backyard’ mentality or the belief that ‘HIV/AIDS will not affect me’ has to change. Addressing high-risk behavioural patterns and reducing stigma attached to HIV/AIDS require education about the epidemic and the potential effect on a community or an individual’s vulnerability, for both mobile populations and non-mobile populations. Maps will assist in this education.

Figure 15. A layered map of Guangxi province, China*



**This map shows how spatial links can be shown when information, such as vulnerability, mobility and HIV prevalence, are layered together.*

Source: UNDP-SEAHIV, 2003

F. Review and update

It is necessary to review and update the map since thematic elements, such as transportation, migration, location of businesses, and other socio-economic activities are dynamic: they change with time. Revisions and updates will also show the effectiveness of policies – based on the map information – in addressing the HIV situation. By seeing the change through time, a pattern may develop or other hotspots may be identified and policies and strategies can be adjusted accordingly. Further community participation may increase as well, as more people will become familiar with the mapping effort and its effectiveness and may wish to provide additional information.

Map revisions and updates will generally be based on the current political climate and resource availability (i.e. people and finances), thus revisions and updates will be at the discretion of the group or organization responsible for the study. There are advantages and disadvantages depending on the regularity of updating maps and they can include:

- Biannual updates
 - Advantage: maps are updated regularly
 - Disadvantage: not enough 'new' information to map; no significant change from policies or strategies
- Annual updates
 - Advantage: sufficient time to implement policies and strategies; see change over time
 - Disadvantage: depends on resources; not enough resources for frequent updates

Another aspect to keep in mind is that if mapping is being used as a tool for an Early Warning Rapid Response System (EWRRS), it might also be useful to update the maps and data at the same time the EWRRS is being updated or revised to current development projects. A summary of the mapping process can be found in Annex I.

2. An example of mapping

Everyone has made a map one time or another. Here is an exercise that will get you in the mapping mood and will also show that making and reading a map is more than just showing locations of features, but also a tool for analysis and discussion.

What you will need:

- One piece of paper
- Two different coloured pens or pencils

Step 1

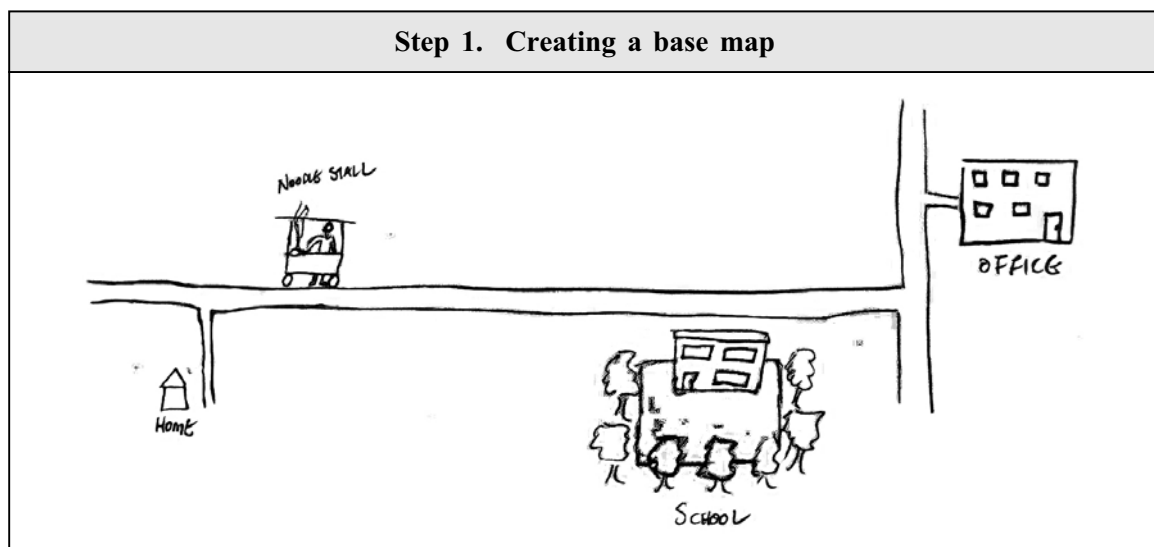
Draw a simple sketch map showing the daily route you take from your home to your workplace. If you work from your home then choose another common destination, such as a grocery store, and make a map to that destination.

Add any transportation methods that you come across on your daily journey, such as:

- Roads you take
- Rivers you cross
- Railway lines

After you have done this, add the main services that you use or you may use on the route, such as:

- Noodle stalls
- Betel shops
- Newspaper stands
- Photo shops
- Convenience stores
- Petrol stations
- Cafes
- Schools where you drop off your children
- Any others you can think of



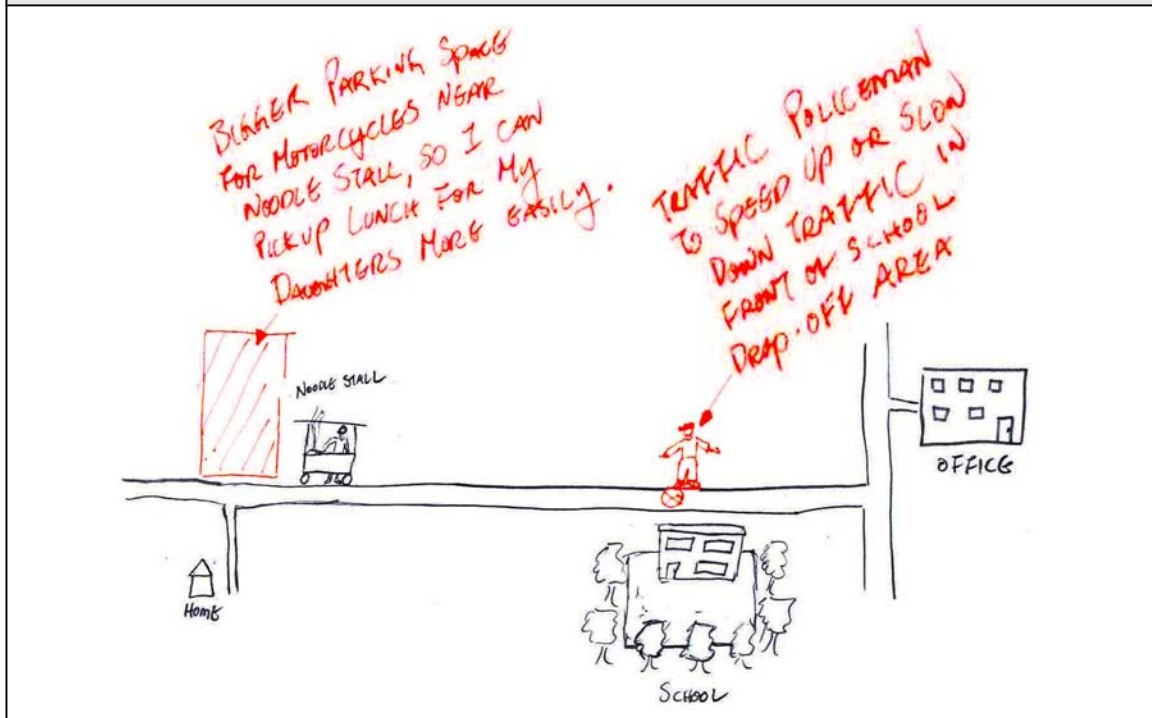
Now that you have your base map, you can layer information that is important to you!

Step 2

Now take a different coloured pen or pencil. Mark on the map ways in which it could be easier and more convenient for you to use the services along the route.

For instance, you can mark a new parking lot to be constructed for your motorcycle at the noodle stall, a wider bridge to reduce traffic congestion while crossing the river, having newspaper sellers on the railway platform or a police officer who will keep traffic moving in front of a school.

Step 2. Ideas put on the base map to identify challenges and improvements



Step 3

Finally, show the map to a co-worker.

In one sentence, tell them that this is a map to promote more convenient services for you on the way to work and ask them to explain the map to you. Don't interpret the map for your co-worker - let them explain it to you. Ask them what they think about your map and what opinions they have of it. By doing so, discussions can be generated that may be able to assist in improving your ideas and/or responses to the challenges shown on the map.

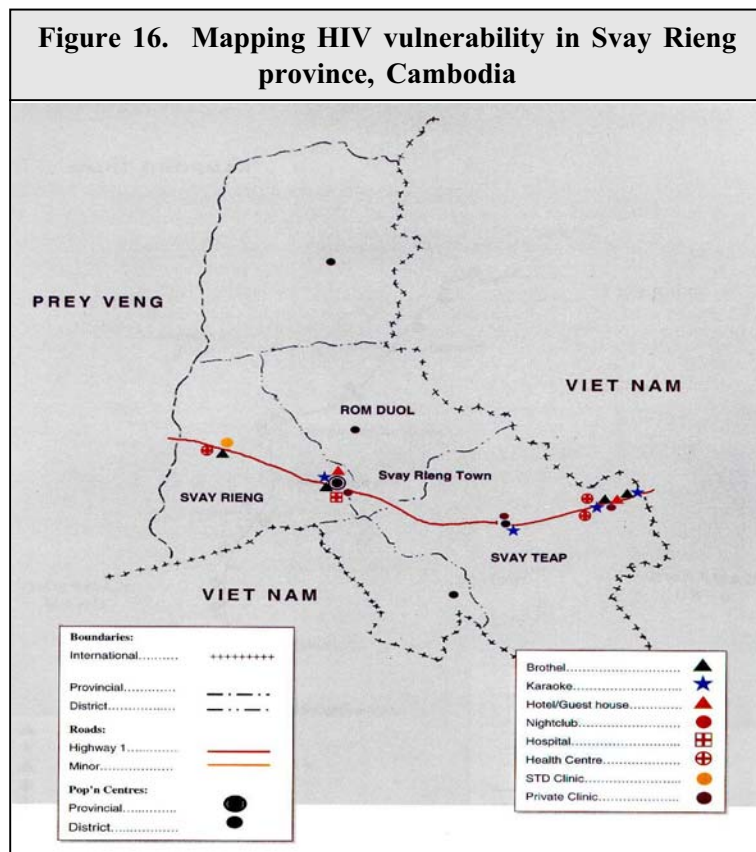
IV. PROGRAMMING AND MAPS

1. Using maps for programming

Maps are best developed with a programme in mind (refer to box 6). Maps can show interrelationships of various sectors that may not initially be thought to have had an impact from HIV. They can also show the resources of current programmes and can provide donor-education and advocacy, as well as where to target future programmes. Maps are tools to bridge theory with issues related to programme activities. Specific case studies of how mapping can be used to develop effective programmes can be found in the RESOURCES section in Chapter V.

Examples from Cambodia (figure 16) and Africa (figure 17) of how maps have been used to develop effective programmes are shown below.

Figure 16 shows one of the maps that were produced in mapping HIV vulnerability along Highways One and Five in Cambodia, which led to the development of multisectoral services for sex workers and construction workers along the route.¹³ In Africa, along the Durban-Lubumbashi highway route, mapping identified the resting points near major border points of where truck drivers spend considerable lengths of time (figure 17). HIV prevention and care activities were subsequently developed for sex workers, truckers and traders.



Source: UNDP-SEAHIV, 2000

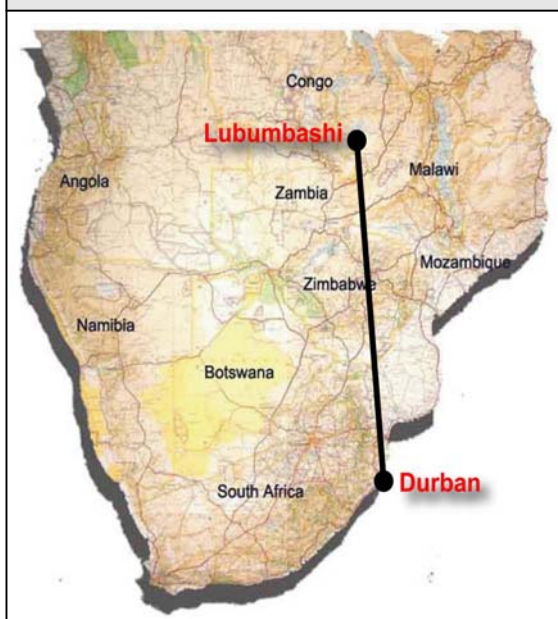
¹³ Cambodia HIV Vulnerability Mapping: Highway One and Highway Five (UNDP South East Asia HIV and Development Programme, January 2000), <http://www.hiv-development.org/publications/cambodia_mapping.htm>.

Box 6: Factors to consider when mapping for programme interventions

On the basis of mapping the study area, we begin to examine whether it is feasible to initiate interventions in the entire site or whether we must limit ourselves to sub-sites. In deciding, we should consider the following factors:¹⁴

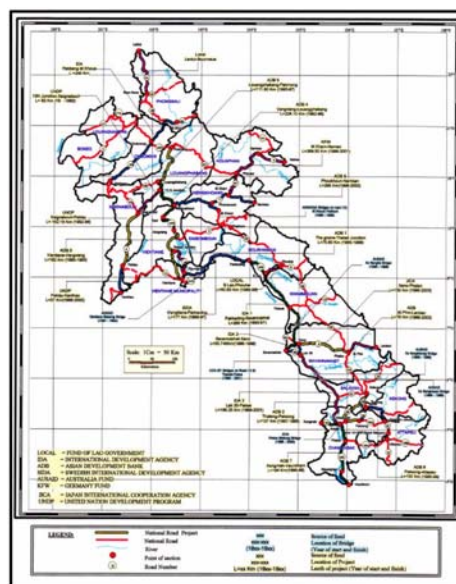
- If the project area's population is more than 1 million people, it may be advisable to limit ourselves, at least initially, to sub-sites.
- In widely dispersed areas, it is harder to begin interventions in the entire area.
- In sites consisting largely of informal settlements, it may be harder to cover the entire site. If the settlements are unauthorized, it may be even harder to conduct an assessment or intervention because of mobility, official discouragement or inhabitant's distrust.

Figure 17. Location of Durban and Lubumbashi in Southern Africa



Source: Mukwashi, 2003

Figure 18. Transportation routes in Lao People's Democratic Republic

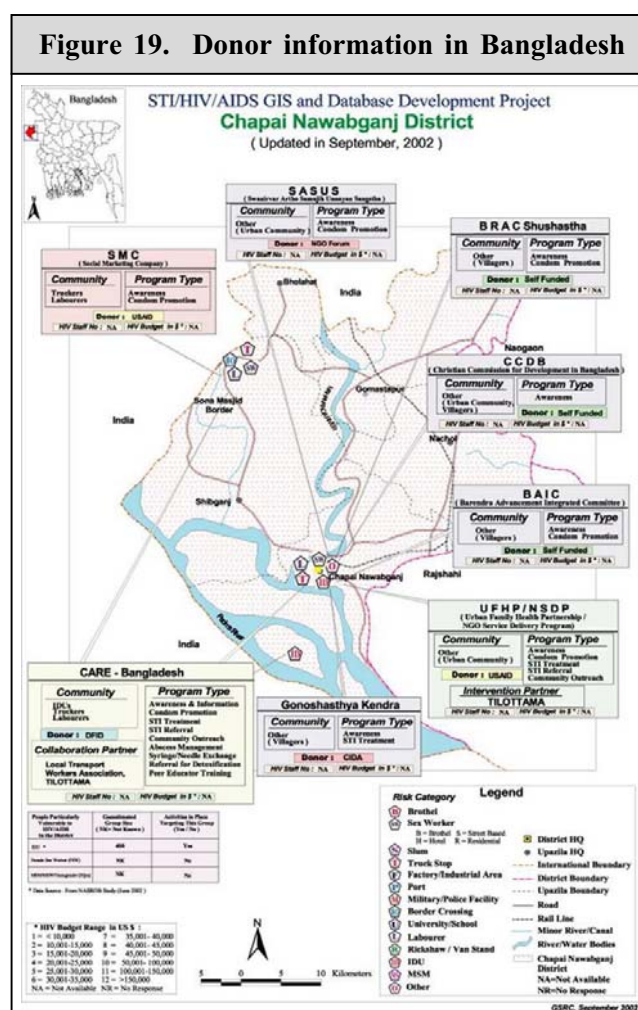


Source: UNDP-SEAHIV, 2000

¹⁴ Wilson, David (2001). *HIV/AIDS Rapid Assessment Guide*. Project Support Group (PSG), Harare, Zimbabwe and Family Health International Implementing AIDS prevention and Care Project (IMPACT), < <http://www.fhi.org/en/HIVAIDS/Publications/manualsguidebooks/RapidAssessmentGuide/rag3.htm> >.

HIV vulnerability mapping along major transport corridors in Southeast Asia shows that transport corridors play an important role in moving people and goods.¹⁵ Roads are a key aspect, as these networks provide linkages between communities. They are the life-support of a region with communities depending on the road network for transporting people and goods. Roads are like the arteries in the human body which can both transfer to the entire system life-sustaining nutrients, such as people and goods, and become conduits for the transmission of infection, including HIV/AIDS. As a result, the development of new roads in an area not only brings about positive changes in terms of development through linking rural and urban areas, but it can also have an impact on how HIV/AIDS spreads. Case studies have shown that increased vulnerability among tribal people accompanies road building in rural Lao People's Democratic Republic (figure 18).

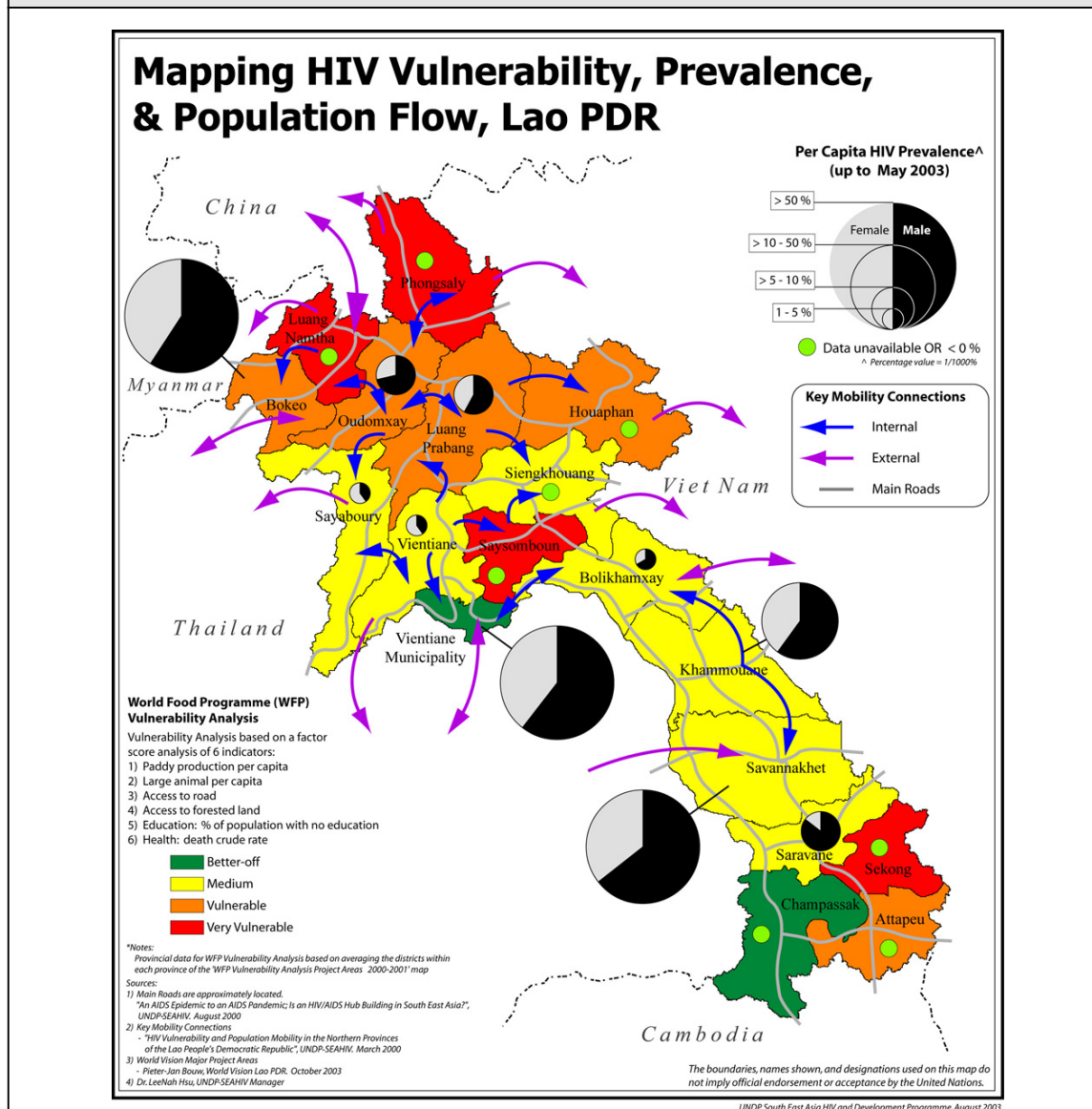
Resources and services available in a given area can be plotted on maps (figures 19 and 20). By showing the availability or lack of resources, it is possible to mobilize different sectors to collaborate in reducing HIV vulnerabilities as such programmes could also benefit these same sectors.



To reflect spatial movement, the following types of maps could be useful:

- Map of cross border population movement
- Map of distribution of people living with HIV
- Map of areas of food insecurity

Figure 20. Mobility and food insecurity as an indicator of HIV vulnerability



Source: UNDP-SEAHIV, 2003

2. Limitations of maps

The usefulness and effectiveness of maps have limits. As the following list will show, there are a variety of factors that one needs to consider and be critical of when mapping. These limitations are not exhaustive, but rather a sample of what should be considered when *making* or *reading* a map.

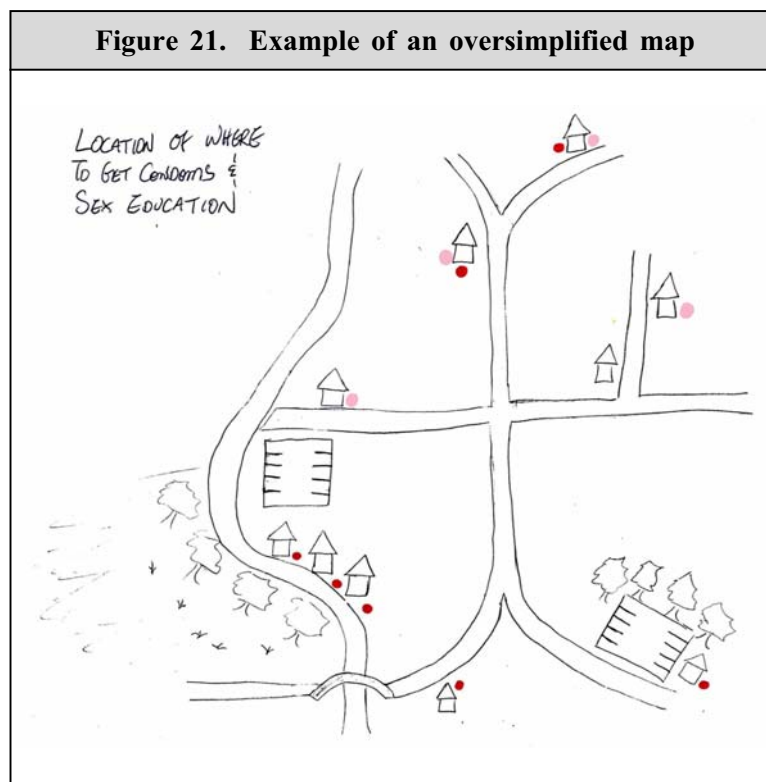
- Making maps:
 - Maps are historical. They need to be regularly updated to reflect changing situations. A sequential map can show changes over time but sometimes graphs can be used instead.
 - Availability of data is dependent on the sector or organization. Data and information may be difficult to obtain depending on your purpose or on the organizations' policy on data-sharing. The quality and type of data on the map must therefore be considered as they affect the map's message. Be careful in using second-hand data for maps.
 - One should also be careful not to overuse a small sample to represent a large area or to use aggregated data to represent discrete, smaller subdivisions. Provide confidence intervals for data whenever possible. **Don't let the map present what the data cannot support.**
- Using maps:
 - Maps can lead to unintended consequences for vulnerable people.
 - Distributing a map or data about vulnerable groups (e.g. injecting drug-users) or the locations of their activities (e.g. shooting galleries) without careful consideration can bring about harm or other consequences to these people. For example, if a map shows the location of ethnic people or where there are trafficking activities, this may lead authorities to use this information to move displaced people out of their current place of settlement.
 - Although proper coordination with relevant local authorities can assist in the mapping process, this depends on current authority's sensitivity and understanding of vulnerable people – this may change with a change of administration. For example, if maps or data showing the locations of vulnerable people were in the hands of authorities who do not respect their confidentiality, this may lead to the harassment or arrest of the very people the mapping exercise was meant to assist.
 - There is a frequent assumption that maps made with computers or other technologies are more acceptable than simple hand-drawn maps. This should be carefully analyzed since unfolding high technology maps may impress an audience but can hide poor data quality by giving the false impression of quality.

- GIS technology can be used to produce graphical representation of large national or district maps, but GIS may not be necessary for developing HIV vulnerability maps to guide programmes. A simple hand-drawn map may produce the required results cheaper, quicker and more flexibly than a GIS, which is usually expensive and resource intensive.
- Maps may not be useful for presenting highly complex information.

The following examples will illustrate certain limitations which one needs to consider when making or reading maps. The objectives of these example maps are as follows:

- 1) To showcase different types of maps that can be made; and
- 2) To highlight certain limitations or faults in making an HIV vulnerability map.

Example 1 – Oversimplified map

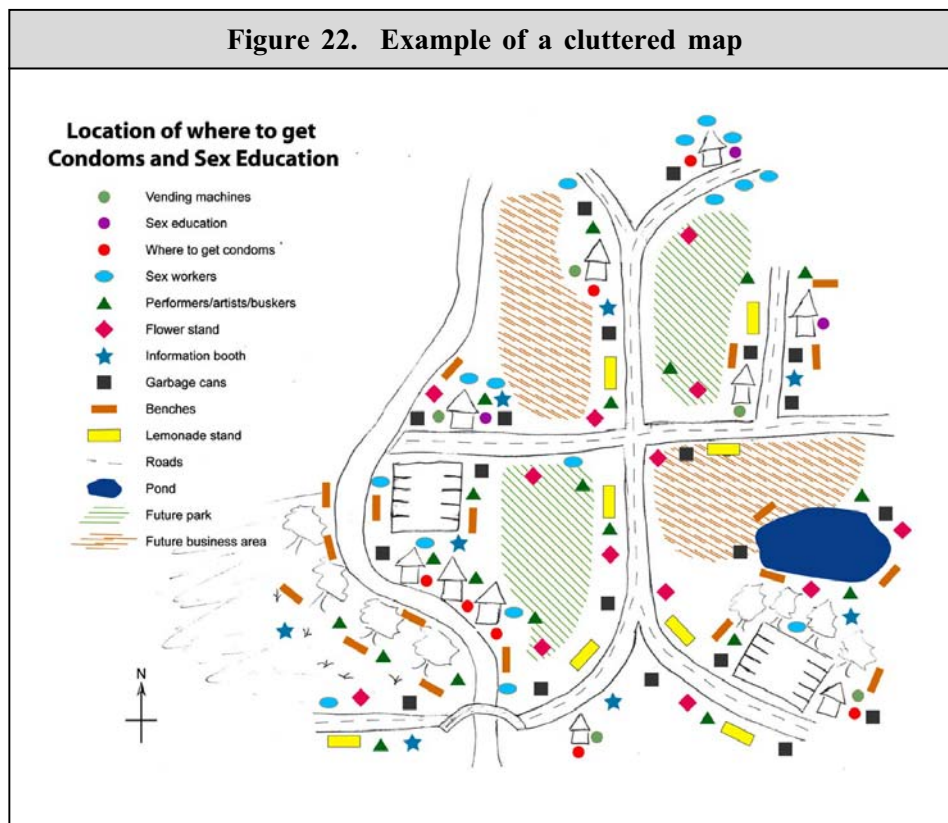


- 1) Figure 21 is an example of the hand-drawn map that one can make to sketch out a mapping site or project area.
- 2) The limitations of this map:

- a. No legend to indicate what the pink and red dots represent as well as the other figures in the map (i.e. do you see the difference between roads and rivers?)
- b. Although the dots show the location of condoms and sex education, this information is too limited to develop effective programmes for intervention.

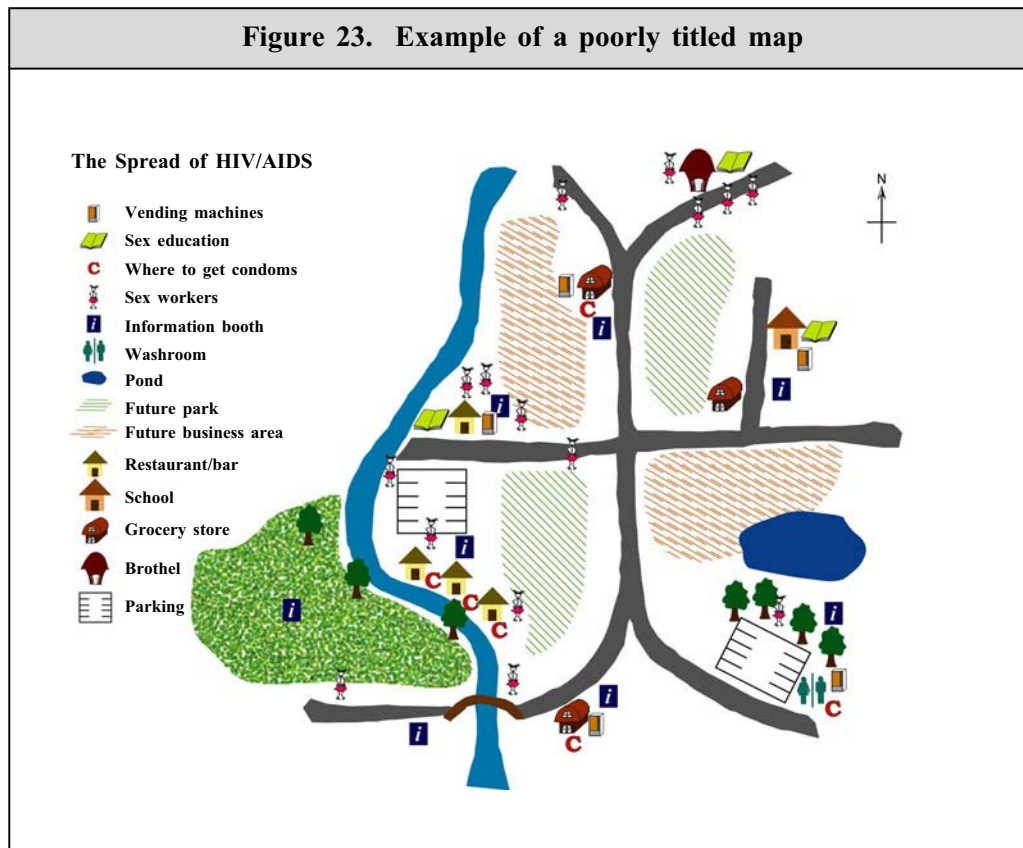
Example 2 – Cluttered map

Figure 22. Example of a cluttered map



- 1) Figure 22 is an example of how the hand-drawn map in the above example can serve as a base map for adding other information in digital form.
- 2) The limitations of this map:
 - a. Even though there is now a legend and plenty of information displayed on the map, it is difficult to see the message of the map, which information is relevant and the spatial relationships between the key items.
 - b. Shapes and colours are useful features in mapping. This example, however, uses too many shapes and colours that it becomes too cluttered for one to understand the message.

Example 3 – Poorly titled map



- 1) In figure 23 the hand-drawn information has been transferred entirely into digital form.
- 2) The limitation of this map:

Although one can say that this map would be useful for programme purposes, the title does not reflect what the map intended to show. The title is important in guiding the readers to the key message of a map. Stigmatization and discrimination may occur if a reader, who may not have any previous knowledge of HIV/AIDS or vulnerability, sees this map and title – they may think the spread of HIV/AIDS is caused by sex workers.

As the above examples show, the purpose, process and design of a map may lead to a misuse or misinterpretation of the information. The limitations and faults noted are but a few examples. Can you think of anything else that might hinder the design and use of maps?

Box 7: Summary of HIV vulnerability mapping

- Determine the purpose of your map
- Include multisectoral collaboration – drawing on the knowledge and experiences from the local community/area
- A base map of the mapping area should include identifiable landmarks (i.e. streams, mountains, roads, borders)
- Use information that interests you or your audience
 - Beware of the potential consequences if using particular data
- Designing the map should be fun!
 - Be creative and make the map interesting to your audience
 - Make sure to include a legend
- Keep things simple
 - The less complicated the map, the easier it is to interpret and analyze, and the more useful it is for making informed decisions.

3. Considerations

Mapping and maps are effective tools for addressing HIV vulnerabilities and for designing and implementing programme activities. UNDP-SEAHIV reviewed the impact of mapping for local government and communities and found that mapping and maps are not only important tools for programme advocacy, planning and monitoring, but it is also a medium through which multisectoral and multilevel cooperation and approaches to HIV/AIDS can be developed.¹⁶

Outcomes and lessons learned include:

- Participation
 - Mapping engages the local community and other stakeholders in identifying particular issues of vulnerability to HIV in the area
 - Mapping creates a forum where people can exchange knowledge and experience thus facilitating an environment of learning and understanding
 - Builds trust and confidence
 - Gives people a sense of value and pride in making a difference in their own community

¹⁶ For more information on lessons learnt using mapping methodology, please also see: Toolkit for HIV prevention among populations in the Greater Mekong Subregion (UNDP South East Asia HIV and Development Programme, 2002), <<http://www.hiv-development.org/publications/Tool-Kit.htm>>; and The Impacts of Mapping Assessments on Population Movement and HIV Vulnerability in South East Asia (UNDP South East Asia HIV and Development Programme, September 2001), <<http://www.hiv-development.org/publications/mapping.htm>>.

- Capacity Building
 - Mapping allows people to learn and transfer new skills, as well as share their knowledge and experiences with others
 - Mapping provides officials and/or community leaders with information to address the local HIV situation with locally-designed strategies
 - Mapping helps to educate the public on the (spatial) connection between development activities and HIV/AIDS.
- Advocacy Tool
 - Maps can be used for educating leaders and organizations at all levels
 - Visual representation assists leaders to rapidly assess the situation and provides guidance for formulating appropriate programmes or strategies.

Mapping and maps are tools that should not be limited by the availability of resources. The basic method can be applied from a 'hands-on' approach to a more technologically sophisticated one. One can always adjust the level of sophistication of making a map, depending on the availability of resources. In many cases, simple and cheap methods will be preferable to costly ones.

One must remember that this Guide is ONLY a guide. It is to provide the reader with the knowledge of the fundamental concept and basics to mapping. The Guide is structured as such so the reader, using their own resources and capabilities, can apply these methods to suit their local environment and community.

Development, mobility and HIV/AIDS cross space and time, and are not confined by boundaries or borders. Mapping is a useful tool because it can incorporate information, through the participation of people, from various sectors into a visual product. By using maps as a tool, spatial links and relationships are brought to the forefront and we are able to identify what is 'known' and what may be 'unknown', allowing people to respond and develop effective strategies and programmes for addressing HIV/AIDS.



*Photograph of A.O.C. the cat by Jacques du Guerny
Source of globe: National Aeronautics and Space Administration*

V. RESOURCES

Hopefully this Guide has been a useful introduction into understanding HIV vulnerability mapping and maps. The following information is intended to assist you in finding out more about how maps and mapping have been used effectively in programme activities, where to find (base) maps and data and other useful mapping resources.

1. Case studies

The following case studies will highlight different aspects of the mapping methodology. We hope that it will encourage you to develop additional ways to apply and implement mapping methodologies to assist in reducing HIV vulnerability and building HIV resilience in your own community.

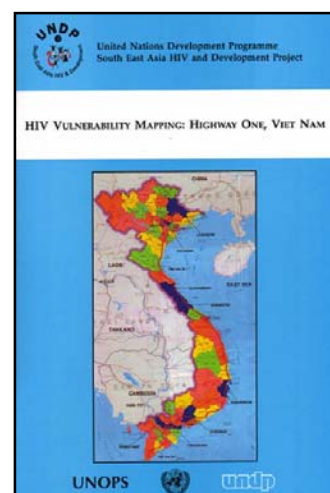
Case one: HIV Vulnerability Mapping: Highway One, Viet Nam¹⁷

Supported by: UNDP South East Asia HIV and Development Programme

Collaborating Agencies: National AIDS Bureau, Viet Nam, Sociology Institute, Social Development Research and Consultancy and UNDP Hanoi

Terms of reference for the research team:

- Assess the most important road and river routes leading to borders for people travelling to and from Cambodia, Lao People's Democratic Republic and China
- Identify hotspots of sexual activity and drugs along these routes
- Develop tools for a rapid assessment and perform a rapid assessment of the risks/vulnerabilities of three groups of people at the hotspots: transport employees, travellers and resident people along the route
- Map the hotspots in both representational and narrative form on the following themes:
 - Volume and flow of transported goods
 - Passenger volume and flow
 - Stopping points and crossroads
 - Services available for transport employees and travellers
 - Risky behaviours
 - Factors leading to vulnerability
 - STI prevalence



¹⁷ HIV Vulnerability Mapping: Highway One, Viet Nam (UNDP South East Asia HIV and Development Programme, October 2000), <<http://www.hiv-development.org/publications/Vietnam-highwayOne.htm>>.

- HIV prevalence
- Condom availability
- Other themes that affect risk and vulnerability
- Report on the findings and make recommendations for effective programmes involving all three groups of people

Findings:

- The most important transport routes were chosen on the basis of the volume of cross border and inter-provincial traffic, plans for road upgrading, intersections of land water transport routes, and connections with routes being studied in neighbouring countries.
 - Highway One in Viet Nam was chosen as the main route studied as it has national significance as well as trade and transport functions.
- Many of the hotspots are near provincial or national borders or river and sea ports where land and water transport routes converge.
 - They offer food, drink, accommodation and sexual services as well as safe places to park vehicles loaded with goods.
- Hotspots fluctuate in degree of activity; new hotspots develop as others are suppressed.
 - Suppression leads to hotspots being formed on the other side of borders or to services being offered in more clandestine ways that may increase HIV vulnerability and risk.
- It was very helpful to have the research teams joined in the field by provincial level officials who worked in the field of HIV.
 - The officials were initial guides in determining where hotspots of HIV vulnerability might be or where hotspots had already been identified.
 - Asking provincial level officials to join in the research teams also built provincial level capacity in mapping and rapid assessment techniques.

Case two: Mapping HIV Vulnerability along Kampong Thom, Siem Reap, Odor Meanchey and Preah Vihear, Cambodia¹⁸

Supported by: UNDP South East Asia HIV and Development Programme

Implemented by: National AIDS Authority, National Centre for HIV/AIDS, Dermatology and STD (Ministry of Health), Ministry of Public Works and Transport and Ministry of Rural Development, Cambodia

Background:

This mapping assessment on Route Six in Cambodia was part of the Provincial and Rural Infrastructure Project (PRIP), supported by the World Bank Loan, to rehabilitate and improve the state of Cambodia's infrastructure. The goal of the mapping assessment was to identify HIV vulnerabilities in communities affected by the PRIP in order to build HIV resilience.

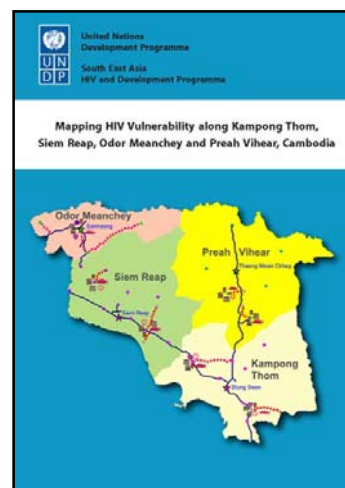
¹⁸ Mapping HIV Vulnerability along Kampong Thom, Siem Reap, Odor Meanchey and Preah Vihear, Cambodia (UNDP South East Asia HIV and Development Programme, March 2004), < http://www.hiv-development.org/publications/cambodia_prip.htm>.

One of the specific objectives for this assessment was to conduct mapping of the PRIP project coverage area to identify the socio-demographic and economic status of communities, possible indicators and hotspots within the project area.

Findings:

Through the mapping assessment methodology, a data collection interview questionnaire was developed by the project team. By identifying this data on a map, they can be considered indicators in determining the location of hotspots. The following is a sample of questions from the questionnaire developed for this assessment, which was used to map mobility and HIV vulnerabilities along Route Six in four provinces in Cambodia:

- Where do people go for sex-related services?
- Number of hotels and guesthouses?
- What could be identified as a hotspot?
- How many private clinics and pharmacies are located in the provinces both legal and illegal?
- Number of transit places?
- Where could we find condoms?
- What is the main mode of transportation in the community?
- Where do you go when you get sick?
- Where do you go when you get STIs?
- Do you have transportation (ox cart, bicycle, motorcycle, taxi, car, etc.)?



When we think of the scale or intensity of the hotspot and how to represent this on a map, there are various methods that can accomplish this task. One simple method is a matter of representing each individual item (i.e. person, health facility, bars, sex establishments, etc.) with a symbol (e.g. dots). By representing each item with a symbol, once all the information is mapped, one can stand back and review the map to see where there are high concentrations of these symbols, indicating the current or potential situation for hotspots to develop.

Case three: Mapping in the Mekong Region – A methodology under consideration¹⁹
Supported by: US Agency for International Development (USAID)

Purpose:

- To obtain an initial listing of hotspots in the Mekong Region
- To list the activities of organizations
- To identify gaps as well as locations that are over-served
- To improve strategic planning of programmes in collaboration with others

¹⁹ Presented by Matt Friedman (USAID) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, <<http://www.usaid.gov>>.

Possible methodology:

- Contact organizations in each country and send a brief questionnaire
- Gather information of ‘who is doing what’ throughout a given country
- Develop a database that contains a listing of geographical hotspots based on a set of assumptions (to be determined)
- Undertake ‘consensus & participatory discussion techniques’ in each country
- Carry out selected site visits
- Produce maps that show the results



Source: USAID

2. Where to find maps

- Aerial photographers
- Cartographic institutes
- Census offices
- Community groups
- Development agencies
- Donors
- Government offices, especially from the Ministry of Transportation
- Household demographic surveyors
- Multilateral organizations
- Multisectoral committees
- Population committee offices
- Private companies and corporations
- Satellite agencies
- Schools
- Survey offices and surveyor general
- Universities
- Village or municipality offices
- Websites

Some useful websites for maps and data:

- International Steering Committee for Global Mapping
(Comment: A large data warehouse for GIS data and base maps – sign up for login ID and password)
<<http://www.iscgm.org/html4/index.html>>
- GeoNetwork
Sharing geographically referenced thematic information between different FAO Units, other UN Agencies, NGO's and other institutions.
<<http://www.fao.org/geonetwork/srv/en/main.search>>
- Google.com
The most comprehensive image search on the web.
(Comment: From any country Google search engine, click on the 'Image' link and type in 'map' and the geographic location. This will almost always bring up a good base map or outline map)
<<http://www.google.com>>
- Perry-Castaneda Library
Map Collection
University of Texas at Austin
(Comment: A very useful website for maps of different scales and types from around the world)
<<http://www.lib.utexas.edu/maps/index.html>>
- United Nations Cartographic Section
Maps and Geographic Information Resources
(Comment: General and peacekeeping maps, at regional or country levels, available for countries around the world)
<<http://www.un.org/Depts/Cartographic/english/>>

- World Food Programme Vulnerability Analysis and Mapping (WFP VAM)
(*Comment: Contains mapping data and reports on vulnerability*)
<<http://vam.wfp.org/new/index.asp>>

3. Other useful mapping resources

- Aidsinafrica.net
(*Comment: Website shows a dynamic use of maps. Animated mapping that allows one to see a regional overview of HIV prevalence and other outcome/impact indicators for Africa*)
<<http://www.aidsinafrica.net/map.php>>
- All About Maps
(*Comment: An interactive website on defining maps*)
<<http://www.eoascientific.com/cartography/index.htm>>
- Generic Syllabus for GEOG 321: Cartography – Maps and Map Construction
Taught by Amy Griffin, Penn State Geography
<<http://www.personal.psu.edu/faculty/a/1/alg207/teaching.html>>
- GEOG 270 Text
University College of the Cariboo
(*Comment: Sections of the course material can be downloaded in PDF files*)
<<http://www.cariboo.bc.ca/ae/ses/geog/Courses/270/text/index.html>>
- Integrated Approaches to Participatory Development (IAPAD)
(*Comment: Interesting site with information and resources on participatory methods to mapping*)
<<http://www.iapad.org/>>
- Poverty Mapping
Joint initiative by FAO, UNEP and CGIAR to promote the use of poverty maps in policy-making and targeting assistance, particularly in the areas of food security and environmental management.
(*Comment: Maps, graphics, case studies and publications on poverty mapping can be downloaded*)
<<http://www.povertymap.net/>>
- The Aboriginal Mapping Network
A collection of resource pages for First Nation mappers who are looking for answers to common questions regarding mapping, information management and GIS.
(*Comment: Website contains maps, data and alternative methods of mapping*)
<<http://www.nativemaps.org/index.html>>

ANNEX I. Summary of mapping approaches

<i>Mapping process</i>	<i>'Hands-on' approach</i>	<i>'High-tech' approach</i>
Materials:	People, pens, paper, markers	People, computers, software (GIS, desktop publishing, etc.)
1) Identify Mapping Region/Area	Area is generally smaller (local areas, communities, etc.)	Area is generally larger (municipal, national, regional, etc.)
2) Base map	Base map is made from more 'traditional' sources of information <ul style="list-style-type: none"> • Field visit or walk to sketch the mapping area • Local input from community • Trace pre-existing maps from community groups or municipal government 	Base map is made from digital sources <ul style="list-style-type: none"> • Request digital (spatial) data or maps from government, academia and/or specialized organizations • Digitize pre-existing maps with use of digitizer or desktop publishing software • Global Positioning System (GPS)
3) Collect and organize thematic data	<ul style="list-style-type: none"> • Surveys, questionnaires, interviews and other communication with the public • Community or municipal government • Academia 	<ul style="list-style-type: none"> • Surveys, questionnaires, interviews and other communication with the public • Community or municipal government • Academia
4) Design	Add thematic data to base map <ul style="list-style-type: none"> • Hand-drawings • Photographs • Charts • Pictures Add legend so readers can understand the symbols and other identifiers on the map	Add thematic data to base map <ul style="list-style-type: none"> • Digitize thematic data, select an appropriate symbol and add to map • Photographs • Charts • Pictures Add legend so readers can understand the symbols and identifiers on the map
5) Presentation	Typically in hardcopy or transparency format and presentation is usually person-to-person <ul style="list-style-type: none"> • Schools • Public events • Community meetings • Government 	Both hardcopy or digital format and presentation can be person-to-person or to a mass audience: <ul style="list-style-type: none"> • Schools • Public events • Community meetings • Government • Internet • Email
6) Review and update	<ul style="list-style-type: none"> • Biannually • Annually 	<ul style="list-style-type: none"> • Weekly • Monthly • Biannually • Annually

	<i>‘Hands-on’ approach</i>	<i>‘High-tech’ approach</i>
Summary of approaches:	<ul style="list-style-type: none"> • Requires less resources and less financial commitments • Easy to learn • Local communities using local strategies • Local strategies through local participation • Interaction and communication among groups of people 	<ul style="list-style-type: none"> • Can be accurate and precise • Can be easily updated with current information • Incorporates various data formats • Visually stimulating maps • Maps can be easily replicated and distributed to a larger audience • Requires more skilled labour to use computer software

ANNEX II. Glossary

Spatial A term used to describe things related to geographic space, such as the distribution or location of a place, person or issue across a landscape or surface.

Base map Any map of the area of interest which you can add information to.

Cartographer A person who does cartography.

Cartography The process of making and of studying maps and charts, including understanding the history of maps and the design and appreciation of map-making.

Choropleth Using colour or other shading to indicate density per unit area of a phenomenon (e.g. annual rainfall, temperature gradients, percentage of voters); in general, the darker the colour or shading, the denser the phenomenon in reality. Choropleths give a clear, but generalized picture of distribution and this may mask finer details. The Human Achievement Index (HAI) map of Thailand in figure 8 uses shades of green to show areas with high HAI, while shades of red shows areas of low HAI.

Ethnography A method of studying and learning about an individual or small group of people. This usually involves studying the individual or group in their usual environment and trying to gain a detailed understanding of the circumstances of the individual or group in this environment.

Geographic Information Systems (GIS) An integrated tool that combines computer hardware, software, data and trained people to collect, manage, manipulate and analyze spatial information to give a better understanding of the place/location of interest. It is important to note that GIS contains only information relevant to the user or researcher, so other variables may not be part of the system.

HIV Resilience To be able to quickly respond to and recover from the potential, current and future impacts of HIV.

Hotspot A place or location of current or future concentrated occurrences of a particular phenomenon, for example, of HIV/AIDS.

Layer A set or group of common information/data that is added to a map in a systematic process. For example, if one wanted to make a map of their neighbourhood, the following information can be considered 'layers': houses, roads, parks, grocery stores and bus stops.

Layering The process of adding a 'layer' to a map. This can include adding pins or drawing lines or symbols to show the information on the map.

Multisectoral This term includes – in addition to the health sector – other development sectors such as agriculture, construction, education, finance, justice, planning and transportation all linked together in a three-way partnership involving the government, non-governmental organizations and private businesses.

Risk The possibility of danger, damage, injury or other negative consequences resulting from current or future actions or reactions. It is important to note that risk is relative to each individual. For example, although skydiving has obvious inherent risks some people may see this activity as having more risk than others.

Seroprevalence The proportion of persons who have evidence of HIV infection in their blood at any given time.

Serosurveillance Collecting blood samples for the purpose of testing for disease (e.g. HIV), and of analyzing and interpreting the results.

Site inventory A complete list of information of a study site. This list typically contains information relevant to the study or research. For example, if a study is being conducted about children in a neighbourhood, a site inventory might contain the number of children by age and sex, location of schools, parks and playgrounds.

Stressor Any activity that will cause stress to a system or which may have a potential negative impact on that system. In the context of HIV and development, a stressor can, for example, be the building of a new dam or road which may increase the HIV vulnerability of the surrounding community, including the out-migration of residents to towns or cities where their only source of income may be in sex work or other work with high exposure to HIV, or in-migration of other development activities which may increase exposure or vulnerability of the locals to HIV.

Vulnerability The situation where something or someone can potentially be wounded or harmed.

ANNEX III. References for figures in this guide

Figure 1	Map No. 3853 (United Nations Department of Public Information Cartographic Section, October 1994), < http://www.un.org/Depts/Cartographic/english/ >.
Figure 2	Provided by Matt Friedman (USAID) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.usaid.gov >.
Figure 3	Pisani, E. (2003). <i>Changes in the sources of new HIV infections in Cambodia over five years</i> . The epidemiology of HIV/AIDS at the start of the 21st century: reviewing the evidence. UNICEF: New York.
Figure 4	Wilson, David (2001). <i>HIV/AIDS Rapid Assessment Guide</i> , Project Support Group (PSG), Harare, Zimbabwe and Family Health International Implementing AIDS prevention and Care Project (IMPACT), < http://www.fhi.org/en/HIVAIDS/Publications/manualsguidebooks/RapidAssessmentGuide/rag3.htm >.
Figure 5	Provided by Dimitri Prybylski (FHI) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.fhi.org >.
Figure 6	Provided by Dimitri Prybylski (FHI) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.fhi.org >.
Figure 7	Provided by Jamie Uhrig (Consultant) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand,
Figure 8	a) Locations of countries in Asia, < http://www.lib.utexas.edu/maps/middle_east_and_asia/asia_pol00.jpg >. b) Choropleth map of the Human Achievement Index of Thailand (United Nations Development Programme, 2003), < http://www.undp.or.th/publications/NHDR03.html >. c) Topographic map of Mt. St. Helens, USA before eruption in 1980, < http://www.csus.edu/indiv/s/slaymaker/Archives/Geol10L/WAmounts1.jpg >.
Figure 9	Provided by Wisa Wisesjindawat (UNESCO) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.unescobkk.org/culture/trafficking >.
Figure 10	Population Mobility and HIV/AIDS in Indonesia (UNDP South East Asia HIV and Development Programme, November 2001), < http://www.hiv-development.org/publications/Indonesia.htm >.
Figure 11	Monywa Project Site Plan, < http://www.ivanhoemines.com/i/Maps/monywa-siteplan.gif >.

Figure 12	Provided by Matt Friedman (USAID) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.usaid.gov >.
Figure 13	Provided by Dimitri Prybylski (FHI) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.fhi.org >.
Figure 14	Williams, Andrew. <i>Making Sense of the World Around Us: An Introduction to Geographic Information Systems</i> , < http://www.kingston.ac.uk/esg/gis_for_teachers/Intro_GIS/intro_article.htm >.
Figure 15	UNDP South East Asia HIV and Development Programme, October 2003, < http://www.hiv-development.org >.
Figure 16	Cambodia HIV Vulnerability Mapping: Highways One to Five (UNDP South East Asia HIV and Development Programme, January 2000), < http://www.hiv-development.org/publications/cambodia_mapping.htm >.
Figure 17	Provided by Patience Mukwashi (University of Natal) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand.
Figure 18	HIV Vulnerability and Population Mobility in the Northern Provinces of the Lao People's Democratic Republic (UNDP South East Asia HIV and Development Programme, April 2000), < http://www.hiv-development.org/publications/Vulnerability-Lao.htm >.
Figure 19	Mapping HIV/AIDS Prevention and Care Activities in Bangladesh (update) (USAID, March 2002), < http://www.usaid.gov >.
Figure 20	UNDP South East Asia HIV and Development Programme, September 2003, < http://www.hiv-development.org >.
Figure 21	Example developed for this Guide (UNDP South East Asia HIV and Development Programme, July 2004), < http://www.hiv-development.org >.
Figure 22	Example developed for this Guide (UNDP South East Asia HIV and Development Programme, July 2004), < http://www.hiv-development.org >.
Figure 23	Example developed for this Guide (UNDP South East Asia HIV and Development Programme, July 2004), < http://www.hiv-development.org >.
Figure 24	Provided by Matt Friedman (USAID) at the Expert Consultation on Alternative Methods of Mapping HIV Vulnerability held 15-17 June 2004 in Bangkok, Thailand, < http://www.usaid.gov >.

ANNEX IV. List of contributors

Expert Consultation on Alternative Methods of Mapping HIV Vulnerability Bangkok, Thailand 15-17 June 2004

PARTICIPANTS	
1. Jacques du Guerny	Programme on Interrelations between Population, Development and the Environment (PRIPODE)
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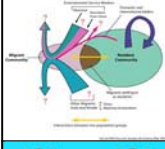





United Nations Development Programme



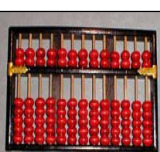

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HIV and Development Programme
<http://www.hiv-development.org>






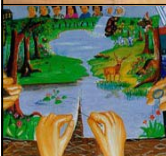
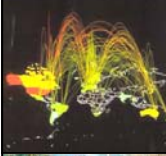







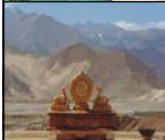





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	Mapping Made Easy: A guide to understanding and responding to HIV vulnerability http://www.hiv-development.org/publications/mapping_vulnerability.htm Compiled and edited by Vincent Fung A joint publication of UNDP-SEAHIV, UNESCO, WB, WFP, FHI, USAID, IOM and WVI <i>Language: English</i>	974-92512-6-1 October 2004
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	A Development Strategy to Empower Rural Farmers and Prevent HIV* http://www.hiv-development.org/publications/HESA.htm Authors: Jacques du Guerny, Lee-Nah Hsu and Sin Chhitna A joint publication of UNDP/UNOPS and FAO <i>Languages: English, Chinese, Burmese, Khmer, Laotian, Thai, Vietnamese</i>	974-680-200-3 January 2002
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	Population Mobility and HIV/AIDS in Indonesia* http://www.hiv-development.org/publications/Indonesia.htm Author: Graeme Hugo A joint publication of UNDP-SEAHIV, ILO, UNAIDS and AusAID <i>Language: English</i>	92-2-112631-5 November 2001










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	HIV Policy Formulation and Strategic Planning: For the communication, transportation, post, construction and tourism sectors, Lao People's Democratic Republic* http://www.hiv-development.org/publications/land-transport-Lao.htm Workshop organized by UNDP-SEAHIV, NCCAB and MCTPC, Lao PDR <i>Languages: English, Laotian</i>	974-680-184-8 October 2001
	Assessing Population Mobility and HIV Vulnerability: Guangxi, People's Republic of China* http://www.hiv-development.org/publications/Guangxi.htm Authors: Wei Liu, Jie Chen, Zhoufu Qin, Shaoling Liang, Yongjian Li, et al. A joint publication of UNDP/UNOPS and UNAIDS <i>Languages: English, Chinese</i>	974-680-185-6 September 2001
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	HIV Subverts National Security* http://www.hiv-development.org/publications/Subverts-Security.htm Author: Lee-Nah Hsu <i>Languages: English, Chinese, Vietnamese</i>	974-680-192-9 August 2001
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	Land Transport & HIV Vulnerability: A development challenge* http://www.hiv-development.org/publications/development-challenge.htm Prepared by UNDP/UNOPS, UNAIDS and UNESCAP A joint publication of UNDP/UNOPS, UNAIDS and UNESCAP <i>Languages: English, Chinese, Laotian</i>	974-680-186-4 April 2001


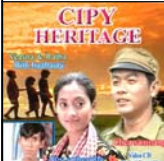
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	<p>Assessing Population Movement & HIV Vulnerability: Brunei – Indonesia – Malaysia – Philippines linkages in the East ASEAN Growth Area*</p> <p>http://www.hiv-development.org/publications/BIMP.htm</p> <p>Prepared by Scalabrini Migration Centre</p> <p>A joint publication of UNDP/UNOPS and UNAIDS</p> <p>Language: English</p>	974-680-175-9 November 2000
	<p>HIV Vulnerability Mapping: Highway One, Viet Nam*</p> <p>http://www.hiv-development.org/publications/Vietnam-highwayOne.htm</p> <p>Prepared by UNDP-SEAHIV in collaboration with National AIDS Bureau, Sociology Institute, Social Development Research and Consultancy and UNDP Hanoi, Viet Nam</p> <p>Languages: English, Vietnamese</p>	974-680-176-7 October 2000
	<p>Indonesian Overseas Contract Workers' HIV Knowledge: A gap in information*</p> <p>http://www.hiv-development.org/publications/Contract%20Workers.htm</p> <p>Author: Graeme Hugo</p> <p>A joint publication of UNDP/UNOPS and ILO</p> <p>Language: English</p>	974-680-173-2 September 2000
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	<p>Early Warning Rapid Response System: HIV vulnerability caused by mobility related to development*</p> <p>http://www.hiv-development.org/publications/ewrrs.htm</p> <p>Authors: Jacques du Guerny and Lee-Nah Hsu</p> <p>Languages: English, Chinese, Khmer, Laotian, Thai, Vietnamese</p>	974-680-169-4 July 2000

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	<p>HIV Vulnerability and Population Mobility in the Northern Provinces of the Lao People's Democratic Republic*</p> <p>http://www.hiv-development.org/publications/Vulnerability-Lao.htm</p> <p>Author: James R. Chamberlain</p> <p><i>Languages: English, Laotian</i></p>	974-85913-8-7 March 2000
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* These publications are no longer available in hard copy format; however, they may be downloaded in electronic form from the following website: <http://www.hiv-development.org>

Additional Publications

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	Crossing national and sectoral boundaries in HIV/AIDS strategies – experiences from South East Asia http://www.hiv-development.org/text/publications/Crossing_Boundaries.pdf Article in Sexual Health Exchange 2003/2 Authors: Lee-Nah Hsu and Jacques du Guerny Language: English	September 2003
	UNESCO/UNDP-SEAHIV/UNAIDS/SMA/CIDA HIV/AIDS: Be safe not sorry Mobilising a Response to HIV/AIDS in the Maritime Industry Course information for instructors, course information for students and CD-ROM course materials Languages: English, Chinese	92-1-120160-8 July 2002
	ADB/UNDP-SEAHIV/WVI/Burnet Institute: Toolkit for HIV prevention among mobile populations in the Greater Mekong Subregion http://www.hiv-development.org/publications/Tool-Kit.htm Languages: English, Chinese, Burmese, Khmer, Laotian, Vietnamese	1-875140-52-2 2002
	Independent Review of the UN Regional Taskforce on Mobile Populations and HIV Vulnerability http://www.hiv-development.org/text/task/review2001.doc Author: Jacques du Guerny Language: English	November 2001
	Strategy on Mobility and HIV Vulnerability Reduction in the Greater Mekong Subregion 2002-2004 http://www.hiv-development.org/publications/Strategy.htm Languages: English, Chinese, Burmese, Khmer, Laotian, Thai, Vietnamese	September 2001
	UNDP-FAO Mobilization and Empowerment of Rural Communities along the Asian Highway (Route 5) in Cambodia to Reduce HIV Vulnerability http://www.hiv-development.org/publications/review-route5.htm Fact sheet and project evaluation report by Jacques du Guerny Languages: English, Khmer	April 2001
	UNIFEM/UNAIDS/UNDP-SEAHIV Information Kit on Women, Gender and HIV/AIDS in East and South East Asia Language: English	March 2001
	Better Safe than Sorry: Preventing HIV/AIDS among mobile populations in the Greater Mekong Subregion Video CD Languages: English, Chinese, Laotian, Vietnamese	2001
	ADB/UNDP/WVI/ARCM: Mobility and HIV/AIDS in the Greater Mekong Subregion Fact sheet, inception report and profiling report Language: English	1-875140-48-4 December 2000

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	<p>Regional Summit on Pre-departure, Post-arrival and Reintegration Programmes for Migrant Worker</p> <p>Workshop organized by CARAM Asia, UNDP-SEAHIV, CHRF and IOM</p> <p><i>Report</i></p> <p><i>Language: English</i></p>	<p>983-40375-0-3</p> <p>September 2000</p>
	<p>CIPY Heritage</p> <p>Producer: Hem Monirith, Director: Tith Thearith, Assistant Manager: Ouk Sokha</p> <p>Technical assistance: Mean Chhi Vun, Lim Thaipheang, Tia Phalla, Seng Sutwantha, Hor Bunleng and Po Samnang</p> <p><i>Video CD</i></p> <p><i>Languages: Khmer with English subtitles</i></p>	<p>November 1999</p>

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